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SELECTIONS FROM KUANG-MING JIH-PAO

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Preface

This serial report is comprised of translations of selected articles from the above-mentioned daily published in Peiping. The source span indicates only the earliest and latest issues processed for any given report and should not be construed as all-inclusive dates. Selections are full translations unless otherwise indicated.

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## I. SCIENCE-TECHNOLOGY

### MAO TSE-TUNG'S IDEA OF THE DEVELOPMENT OF GENETICS

[Following is a translation of an extract from an article entitled "A Route to the Development of Genetics" by T'an Chia-chen (1615-1672) in Kuang-ming Jih-pao, Peiping, 2 April 1961, page 2.]

I consider that the only route to the development of genetics in our country is the route pointed out to us by Mao Tse-tung, namely, to study critically, under the leadership of the Party, the teachings of the two schools and absorb their respective excellent qualities, paying equal attention to the conditions of the development of these two schools of thought, comparing and studying, supplanting defects with remedies.

On the one hand, we must solve the problem of "genes" or "seeds" in the eight-character constitution of agriculture embodied in the program of our national economy of today which is based on agriculture. We must initiate extensive and intensive research and cooperate with the peasants closely in order to make positive contributions, and on the other hand, we must rapidly raise the standard of genetics studies, place our country on a higher footing in the world in the field of genetics, intensively train cadres in genetics, and systematically plan and promote large-scale scientific research projects.

At present, our country occupies no significant position with respect to genetics studies. Strictly speaking, we do not even have any "school." Why should we speak of "schools of thought?" Besides, genetics has already become quite a comprehensive science. We need specialized knowledge and technology in many fields. Furthermore, we should be receptive to opinions of others. We should be united and exert ourselves to accomplish something worthwhile in this area.

In the development of genetics studies today, we may say in short that the students or workers of the two schools should have definite ideas and follow the teachings as explicitly expressed in the editorial of the Hung-ch'i magazine to undertake research from different approaches. In the end, the different approaches will not diverge, but converge, or, in other words, they will be unified. Let me make the following suggestions, which are only tentative, incomplete outlines of our approaches to the unified route.

Seek out the contradictions, distinguishing the primary from the secondary; look for identities, but do not ignore diversities; break away from the old, and create something new; abolish falsehood, but preserve truth; criticize, accept, and absorb; utilize excellent qualities to make

up for deficiencies; concrete problems should be concretely analyzed; factors, both internal and external, will be unified.

I consider that when contradiction arises, it is essential to distinguish the primary from the secondary. Otherwise, each of the opposing sides sticks to its arguments, paying no attention to the essentials. As a result, the fundamental problem remains unsolved. Furthermore, practical problems must be analyzed in a practical way. In some practical problems there exist some relations between the opposite sides, such as possibility vs. practicability; primary vs. secondary; general vs. particular; part vs. whole; continuity vs. interruption; internal factors vs. external factors. We must be able to see the relationship between the opposites, and pay attention to their differences. Otherwise it would not be easy to simplify them, and the result will be generality. In my opinion, the Morgan school laid more emphasis on internal factors, and considered external factors to be simple conditions. On the other hand, the mi-ch'iu-lin school laid more emphasis on external factors, and resulted in overlooking the importance of internal factors and their leading role.

The relationship between internal and external factors has been pointed out by Chairman Mao, "External factors are conditions that stimulate changes; internal factors are the basis of changes. Just how external factors act through [the influence of] internal factors is one of the principal problems of genetics, and also one of the principal problems of biology today." The contradictions will be unified through practical application and under the guidance of the Mao Tse-tung ideology. Therefore, we must raise the red flag of the ideology of Mao Tse-tung higher. On the route to the development of genetics in China, we must study arduously and march forward courageously.

## RAPID DEVELOPMENT OF SURGICAL SCIENCE IN CHINA

[Following is the translation of an article in Kuang-ming Jih-pao, Peiping, 7 April 1961, page 1.]

NOTE: According to the Health Journal, surgical science in our country under the direction of the Party has achieved a rapid development in one long step in the past three years. New operation techniques and therapeutics have been perfected; new theories are being tested.

### New Ways Opened to Surgical Research

Due to the close cooperation between the profession of the traditional Chinese art of healing and the profession of Western medicine, considerable success of importance has been achieved in surgical science, thus paving the way for surgical research. In various parts of the country, besides supplementing the surgical methods of treatment with acupuncture and cauterization, massage, and proper breathing, the application of some of our unique traditional methods of treatment for such common cases as bone fracture, intestinal strangulation, and tapeworm in the bile duct, instruments and machines for diagnosis and treatment are being studied for adoption.

In the area of bone fracture, the old principle of effecting healing has been augmented to include the intake of, and external application of, herbs and drugs. According to a report on more than 10,000 cases, the combination of Chinese and Western methods of effecting local immobilization and early movement of joint balls-and-sockets has resulted not only in simpler and more accurate repositioning and setting, but also in reducing pain in the patient and in shortening the period of recovery. In more difficult cases, such as a partial paralysis due to external injury, and thrombo-phlebitis, many a patient has been spared the necessity of amputation by using the complementary Chinese-Western method of treatment; by utilizing the Chinese principles of diagnosis, acupuncture and cauterization, and massage; by providing proper nursing care; by preventing bed sores and urethral infections. Many teaching and research staffs throughout the country have inaugurated theoretical studies.

New success in this connection has also been achieved in the processes of pre- and post-operation of the heart, the liver, and also in treating extra-thorax injuries. For instance, the Honan Hospital reported that its medical staff has succeeded in strengthening the heart action and in reducing auricular fibrillation in the pre-operation process by resort-

ing to the complementary Chinese-Western method of treatment. The application of acupuncture and cauterization, and of electric needles, in lieu of analgesia and anesthesia has been a new contribution to the science of anesthetics.

The Chinese technique of massage has been definitely proved to produce good results in treating serious sprain and protrusion of certain of the lumbar vertebrae and of the pelvis. In this connection it can be utilized not only to take the place of surgery and other conservative methods of treatment, but also to relieve swelling and pain in spasm, and to restore patients to health. The complementary Chinese-Western methods of treatment, including acupuncture and cauterization, and other external treatments, have cured many cases of suffering and injury in the loins and thighs of patients with good results.

Under the strict conditions set for the selection of applicable cases, reports from all parts of the country show that of the 8,000-odd cases of appendicitis treated by the complementary Chinese-Western method, 80-90% had satisfactory results. Research is being conducted to find ways to prevent relapses in the cases cured. Some of the patients suffering from intestinal obstruction and treated by the complementary Chinese-Western method in accordance with their respective individual differences got well without surgical operation. The specialists are now summing up their clinical experiences, with a view to classifying the types of intestinal obstructions. The complementary Chinese-Western method of treatment has also minimized surgical operations and increased the percentage of cure in cases of perforated ulcer of the stomach and of the duodenum.

#### Improved Technique Brings More and Better Results

Owing to the improvement of techniques in surgery, recovery in surgical cases has been furthered, both quantitatively and qualitatively, and the mortality rate has fallen somewhat during the past three years. For instance, the mortality rate has dropped to approximately 2.1% in 1,082 cases of gastrotomy and 2,735 cases of separation of the bicuspid valve. The surgical mortality rate in cases of tuberculosis of the kidney, tumors of the pituitary gland, and of anastomosis infection has been prevented in a considerable number of cases. New methods and techniques in dealing with cases where physical exercise is made possible without ill effects on open incisions have been developed.

Great success has also been achieved in research pertaining to the treatment of burns. The percentage of recovery from burns of a large area of surface has been raised. There have been new developments in early skin grafting in cases of serious burns to minimize shock. A rich supply of data has been collected pertaining to complications resulting from serious burns, suggesting the optimum quantity and proportion between the crystalline and gummy ingredients in the fluid used to replace the fluid lost in the body. In hand injuries every attempt is made to save the fingers by employing skin grafting and immobilization early. Reports from Shanghai and Peiping areas indicate that of the 4,000-odd cases treated

by this method, more than 90% resulted in satisfactory recovery.

The medical profession has suggested a new classification of the pathological process of bone tuberculosis. It has initiated a movement to remove the cause of the disease, to shorten the length of time required for, and the percentage of recovery. There are new methods of treatment for renal edema and new techniques for urethroplasty. In the area of surgical treatment of pulmonary tuberculosis, of the 10,000 cases of pneumotomy, approximately 90% resulted in satisfactory cure, according to statistics compiled during the past ten years.

#### Extensive Development in New Techniques and Specialized Fields

The past three years have seen an unusually rapid development of new techniques and specialties in the surgical profession. Anesthetics, blood transfusion, bone surgery, and urethral catheterization have been extensively improved. Neural surgery, general surgery, and thorax surgery have become full-fledged specialties and have made achievements worthy of their names. There have been some 200 cases of hepatotomy in various parts of the country. In the field of hepa (liver) surgery, special studies are being made with respect to the lobes and sections of the organ. Research on the reduction of local temperatures of the stomach, and application of this perfected method are being pursued. Progress in various degrees in surgical operation of brain tumor and the suprarenal gland has been reported by the profession in various parts of the country. Research in the area of brain injury, the employment of hibernation in conjunction with medicine or other methods of reduction of bodily temperature have increased the rate of recovery. Research on the treatment of edema of the brain by venous intervention with carbamide and lumbar puncture have yielded good results.

In the area of heart surgery, a rapid development and achievement have been made possible. Since 1957 operations with anesthesia by freezing, by the extraneous blood circulation technique in 600-odd cases, and operation by the direct visual technique in 100-odd cases have been reported from various parts of the country. Direct visual repair of the heart chamber and the ventricular septum is within successful grasp in principle and in practical techniques. Anesthesia by freezing has given impetus to research in direct visual operation of the heart, and has given rise to comparatively great success.

Employment of isotopes, electrocardiograms, electrocerebrograms, photographs of blood vessels of the heart, photograph of blood vessels of the brain, and photograph of small quantities of air in the brain, is quite extensive in the technique of diagnosis. Artificial lungs (iron lungs), artificial kidneys, artificial livers, artificial blood vessels, and other large apparatuses are being experimentally manufactured in the country.

RESEARCH ON AGRICULTURAL CHEMICALS TO COMBAT DAMAGE  
FROM DISEASE AND INSECTS

Following is a translation of an article in Kuang-ming Jih-pao, Peiping, 10 April 1961, page 2.<sup>7</sup>

Research personnel of the Mukden Chemical Industry Research Institute (Yuan) during the past half year, under the guidance of the Party committee, has developed for trial production new agricultural chemical products which have a high degree of effectiveness, a low degree of toxicity and which are simple to produce. A number of new chemicals have already been selected to combat wheat rust, rice blast, millet mildew, cabbage soft rot, and late blight on potatoes. This has furnished beneficial conditions for helping agriculture win a victory over disease and insect damage.

Among the new agricultural chemicals on which successful research has been done in this academy, there are some which are either already being tried in the fields or have undergone experiments in large fields. Their high degree of effectiveness has been attested, and expanded production is now being undertaken. The new wheat rust combatting chemical, "wheat protecting product No.1" last year underwent preliminary trial application on 2,000 mou of wheat fields in Anhwei Province, and its high degree of effectiveness has been proven. To guarantee a rich rice harvest, we are concentrating our efforts against rice blast. This academy and the Liao-ning academy of agricultural science cooperated in carrying out a systematic research program which included careful laboratory selection, observation of individual plants and experiments in big fields. A new highly effective drug for combatting rice blast has already been selected and it can supplant "Ceresan". There has also been trial manufacture of new drugs to combat millet mildew which have proved highly effective in initial experiments.

In combatting insect and disease damages to vegetables, efforts have been concentrated against such important diseases as cabbage soft rot, potato late blight and sugar beet brown mottling. Preliminary experiments with several new chemicals have been successful. Field and laboratory experiments attest that these chemicals have a comparatively high degree of effectiveness against cabbage soft rot and are very effective too against brown mottling in sugar beets, and will permit an increased production of sugar from sugar beets.

At present the research personnel of the academy are entering factories where they are both inspecting current production of principal agricultural chemicals products and cooperating with the factories in expanding research in order to more effectively utilize our country's resources and to produce more and better agricultural chemicals as an aid to agriculture.

THE BASIC EXPERIENCE GAINED FROM THE RAPID DEVELOPMENT OF  
TECHNOLOGY IN INDUSTRIAL CHEMISTRY DURING THE PAST THREE YEARS  
AND THIS YEAR'S PRINCIPAL TASK

/Following is a translation of an article by the Vice Minister of Chemical Industry, Li Su (李蘇), in Kuang-ming Jih-pao, Peiping, 10 April 1961, page 27

i.

During the past three years, technology in industrial chemistry has enjoyed a great development as it has progressed under the glorious illumination of the three red flags: the general line, the great leap forward, and the people communes. Industrial chemical research and planning bureaus have been established throughout the country and work in the scientific technology has been rapidly and greatly strengthened. The number of research and planning bureaus directly under the Ministry of Chemical Industry has been doubled. Many provinces and cities which had no industrial chemical research and planning bureaus in 1957, have now established them. Our country which formerly had no bureaus for disseminating information on chemical technology, now has such bureaus and is gradually developing an information network for industrial chemical technology whose scope is nationwide. From 1957 to 1960, scientific industrial chemical research and project planning corps have doubled. The widespread establishment of scientific research and project planning bureaus and the rapid expansion of scientific technological corps has furnished an important guarantee that work in industrial chemical technology will develop smoothly.

During the past three years, industrial chemical scientific research and planning projects have greatly increased and the branches of scientific research have been supplemented each day. According to statistics from research academies (or centers) directly under the Ministry of Industrial Chemistry, in 1960 the number of research projects in industrial chemistry which had already produced results and which could be used in production was 21 times greater than in 1957. According to statistics from project planning academies, directly under the Ministry of Chemical Industry, the number of projects completed in 1960 was about seven times as great as the total of projects completed during the first five years plan and the inability of project planning

to keep pace with actual work on projects has been essentially eliminated. At the same time, since 1958, work in industrial chemical scientific research and project planning has included new courses of study and a diversification of research and developing of projects with the result that certain areas of research and development heretofore lacking have been added; for example: agricultural chemicals, utilization of natural gas, petroleum chemistry, coal chemistry, synthetic materials, and industrial chemical machinery. A good many important results of scientific research have already been popularized on a broader scale and applied in production and construction. For example, sulphuric acid plants using a catalytic method to accomplish their yearly output of 400 tons, have both shortened the production process and reduced the equipment needed, thus opening an important route to a big technical revolution in the production of sulphuric acid. Another example, in response to demand that protective measures be taken against regional diseases and that the rural labor force be protected, the pharmaceutical industry successfully developed an "anti-insect drug". Clinical experience proves that this drug has an unusually high degree of effectiveness in preventing diseases spread by insects.

It needs to be emphasized that during 1960 the movement for technical innovation and revolution on the industrial chemical front has compiled a record of the most glorious achievement. Through the combined efforts in the field of scientific technology and the productive units, a good many new skills, techniques, and methods have already been successfully applied in such industries as dyes, pharmaceutics, agricultural chemicals, organic synthesis, and basic chemistry. The results of these new techniques have a great significance for the simplification of productive processes, the improvement of equipment, the reduction of capital investment, and the reduction of production costs. The consolidation, popularization, and improvement of these technical achievements indicate the direction which our country will take in carrying out a basic revolution and systematic transformation of our industrial chemistry and will open a new road for speedier more economical development in this field.

Scientific industrial chemical research and project planning which used to be dependent on foreign aid and on the study and imitation of foreign countries has progressively become independent and creative. At the same time we have daily taken on greater responsibility for aiding foreign countries. Before 1958, although there was a certain amount of creativity in certain areas our scientific chemical industrial research and project planning consisted mainly in reproducing or applying the results of foreign research and planning. During the course of the first five years plan, the planning of the large industrial chemical plants was done for the most part with the aid of the Soviet Union and other fraternal countries. During the initial period of constructing the factories and beginning production, we also asked

for guidance from many foreign specialists. Since 1958 we have come to depend more and more on our own strength in carrying out scientific and technical work in the field of industrial chemistry. Furthermore we have had the courage to create rather than to continue to study and copy foreign countries. For example, the construction of small and medium size sulphuric acid plants is based on our own independent plans rather than on plans adopted in their entirety from foreign countries; there has also been creation and innovation of technical processes. In the dyes industry we also used to copy foreign countries, but since the great leap forward, there has been a big increase in the number of dyes we have developed and put into production. In particular during the 1960 movement for technical innovation and revolution, the dyes industry developed still further.

The work of compiling information on industrial chemistry is developing and thriving as a result of the progressive formation of an information network on industrial chemical technology. It is now already possible to report comparatively promptly on domestic scientific and technical development in industrial chemistry; we are also beginning to master the important results of foreign work in industrial chemical technology and science, this is of definite use in promoting production and technical innovation in the industrial chemical industry.

## II.

During the past three years there has been conspicuous and outstanding technical achievements in industrial chemistry. These achievements are the result of resolutely and thoroughly carrying through the Party's general line in respect to our work of scientific research and project planning and of firmly adhering to the policy of quicker, more economical development of our country's scientific technology. In addition to continuing to apply the fundamental lessons derived from our experience, we have also accumulated a good many lessons from concrete experience in practical work. Our conclusions are summarized below:

- (1) Organize in various forms and on a large scale mass activity in scientific technology. If we want to carry through the Party's mass line in respect to our work in scientific technology, we must completely mobilize and organize the masses that scientific technical activity of a mass nature may develop and flourish. A good many areas have gained fine experience along these lines. For example, with the slogan "ten thousand people in a thousand teams form a net work of scientific research" the Kirin corporation of industrial chemistry has established scientific research teams for every workshop and work squad. The Wuhan City bureau of industrial chemistry has organized technical corps to go into the countryside where they combine rural aid with scientific

research work. When the corps has clearly ascertained the situation in respect to available material for industrial chemistry, it determines the subjects on which research may be usefully done and helps the communes establish chemical plants and expands mass activity in experimentation and research.

(2) Carry out "coordination of the three levels". During the past three years, various units of industrial chemical research and planning have carried out internally the practice of coordinating the effort of the leading cadre, the engineers, and the ordinary technicians; externally they have also coordinated three elements: research and planning personnel, school personnel, and production personnel. In addition, the "coordination of three specialities" is being carried out. For example, while carrying out its research, the Shanghai pharmaceutical research office coordinated drug manufacture, pharmacological and clinical operation. The Kiangsu provincial industrial chemical research office while carrying out its work coordinated research in drug manufacture, drug effectiveness, and toxicology. Not a few units are also carrying out the "five on-the-spot activities and three co-ordinated activities". This involves coordinating the work of scientific research, project planning, and production personnel, and involves, as a part of the movement for technological innovation and revolution, carrying out on-the-spot research on-the-spot project planning, on-the-spot work based on these plans, on-the-spot production, and on-the-spot improvement of technique, as a method of carrying out research and experimentation on a given problem. For example, personnel in the Kwangtung provincial industrial chemical project planning and research academy applied this working method when they went into the sulphuric acid manufacturing plant to help carry out technical innovation and to solve a production problem involving toxic residual gas. By so doing they improved production methods and completed work on a research problem of comparatively broad significance.

(3) Closely coordinate the central tasks assigned at various periods when deciding which research subjects have to be dealt with. For example, while helping agriculture, the Shanghai office of drug research clarified the direction its research work should take by holding mass discussion. It decided to place emphasis on research dealing with the prevention and cure of regional diseases which are a menace to the agricultural labor force and on economizing in the amount of grain used by the drug industry. As a result, research developed smoothly and achieved a good record.

(4) Base scientific and technological work on the material resources locally available. For example, in Shansi Province, where there are rich deposits of coal, industrial chemical scientific research throughout the whole Province emphasizes the multiple utilization of coal. The utilization of natural gas was an important subject of research in Szechwan Province's industrial chemical scientific research work. In Szechwan, Yunnan and Kweichow, where there are a great many wild plants, research and experimentation in drug and agricultural chemicals derived from wild plants has become an important subject.

(5) Fight offensive engagements against strong points. A good many units in expanding their mass scientific and technological work are organizing large scale engagements or battles fought by masses of troops in the technological revolution they concentrate superior military power and fight a war of annihilation. The procedure is "first strike the tiger and afterwards join the dragon" (that is first conquer the key problems and then connect and coordinate phases of production). This was all very successful.

(6) Set up model factories and disseminate widely their methods and technology. For example, the achievement of a 400 tons yearly output of sulphuric acid produced according to the catalytic method was preceded by the establishment of a model plant by the Nanking industrial chemical corporation. After a short trial period, a number of model plants were set up in various areas. The progressive lessons gained from these model factories' experience was summed up and the original plans were revised a total of six times before they reached their final form. Now the productive capacity of this type sulphuric acid plant is a thousand tons per year.

(7) Standardized plant planning. In working out plans for plants, promote the application of standardized plans. One standardized plan after undergoing appropriate revision based on local conditions may be suitably used for the construction of several, several tens, or even a hundred factories. In this way the efficiency rate of planning work can be greatly raised. In this way, the former inability of plant planning to keep pace with construction demands is eliminated.

(8) Continually expand scientific and technological corps. A good many units have obtained good results from such methods as operating specialized schools, offering brief training courses, and carrying out on the job training programs.

(9) Promptly disseminate reports on experience and techno-

logical information. In various areas, such methods as convening on the spot meetings, organizing corps to collect and offer technological information, using "itinerant merchants" to convey technological information to the countryside and to factories making and showing slides dealing with the results of the technological revolution and compiling technological bulletins have been used; these methods have resulted in a rapid dissemination of progressive lessons gained from experience and of the latest results of scientific research.

(10) By studying the works of Chairman Mao, improve ideology and methods. During 1960, a good many units have organized the study of Chairman Mao's works with particular emphasis on "the theory of practice" and "the theory of contradiction". This has been conspicuously successful in solving difficult problems arising in scientific and technological work. For example: while carrying out experiments in technological innovation which involve the use of raw drug material, there were those who concluded that to raise the temperature in order to speed up the reaction is a method which will result in destroying the intermediates. Therefore, raising the temperature and increasing the speed of the reaction are contradictory. After studying "the theory of contradiction", these people understood that changing the conditions can remove contradiction and they ceased to believe that raising the temperature and increasing the speed of the reaction were contradictory. They began to search for new and suitable conditions and in the end reduced the period required for the reaction.

During the past three years, industrial chemical science and technology has achieved a record of enormous success, but since a good deal of the work is a result of new findings, experience is lacking and some problems remain. For example, provisions were made for undertaking too many projects with the result that the capacity for accomplishing them was comparatively difused, and some of them were not carried out thoroughly. The technological line, in industrial chemistry, which calls for the reduction or elimination of food grains as material, has not been adhered to with sufficient vigor; some of the results of research and planning are still not of sufficiently high quality; the results of some research have not been sufficiently tested before being applied in building plants for factories, with the result that problems have arisen during the construction of the plants. The defects noted above are small when compared with the successes. If only we take them seriously enough, we already have the triumphant foundation on which to carry out the work of adjustment, consolidation, supplementation, and improvement of technology, all of which will enable us to solve these problems and permit the science and technology of industrial chemistry to continue to realise a better and more complete leap forward.

### III.

1961 is a year for consolidating achievements already made and for continuing to gain new victories, and the central task of the chemical industry is to vigorously tackle aid to agriculture, to go in a big way for basic raw materials for the chemical industry, and to energetically shatter allobstacles in the path of achieving a refined technology.

Vigorously aid agriculture. In regard to chemical fertilizers, it is nitrogenous fertilizers which should be emphasized. We want to vigorously tackle the problem involved in making a thoroughgoing expansion of techniques applied in synthetic ammonia plants which have a yearly output of 800 and 2000 tons. We also want to have plants with a yearly production of 10,000 tons of synthetic ammonia enter production. At the same time we want to solve the "food grain consumption" problem in the production of synthetic ammonia and to do research on the use of low-grade coal to replace coking or high-grade anthracite coal and we want to select for use production processes and equipment suitable to actual conditions in order to expand the scope of raw material use. In this way may be solved a number of problems involved in processing ammonia. In regard to agricultural chemicals, we want to improve through research production techniques of existing kinds of agricultural chemical and to raise the quality of such organic phosphorous insecticides as "the enemy of 100 bugs" and No. 1605, and we want to raise their rate of effectiveness. We want to increase the types of agricultural chemicals and to popularize on a wider scale highly effective agricultural chemicals for which necessary production conditions exist such as the "wheat protecting drug" which combats rust. In addition we must do a good job in carrying out big-field experiments and correctly determining the proper agricultural chemicals to be used according to concrete local conditions and we want to solve all the related technical problems from the production of raw materials to the processing and use of the products. In regard to medicinal drugs, we want to do research on methods of production which will permit a reduction in the use of grain; a case in point is the problem of reducing or eliminating the use of food grains in the production of antibiotics. We want to progress in our research on specific drugs to combat regional diseases and to increases the kinds of specific drugs. In respect to rubber products, we want to continue to improve the quality of rubber goods required by irrigation machinery, tractors and so forth, and we want to increase the useful life of these products. For tractor and new model ox drawn carts, we want to manufacture on a trial basis tires suitable for use in wet fields.

Vigorously tackle basic raw materials for chemical industry. In this area we want to intensify and expand our research in the multiple utilization of natural gas, petroleum gas, coke oven gas, coal, wild plants, and secondary agricultural products (rice husks and corn stalks), in order to expand the source of raw material for the synthetic rubber, solvent and medical drug industries, and in order to create good condi-

tions for realizing the production of raw materials for the chemical industry, without making use of food grains. We want to thoroughly master the key techniques required to operate middle and small scale soda ash plants; we also want to study the problem of utilizing low-grade chemical minerals, a case in point being the technical problems involved in refining sulphur from low-grade sulphur and iron ore.

Go in for refined techniques in a big way. In particular we want to break technological bottlenecks involved in producing materials for the chemical industry according to new methods. We also want to produce sample products as quickly as possible and furnish them for experimental use to various lines of industry.

We want to strengthen scientific theoretical chemical research and research in other areas. The main thing is to seek out the fundamental principles of various new techniques, skills, and methods which emerge during the course of the movement for technical revolution; through theoretical research we may determine the scope and conditions in which these principles will be applicable and thus permit them to function more efficiently. By putting more emphasis on theoretical research, on catalysts, we can improve and increase the effectiveness of catalysts now in use and can make progress in our search for more highly effective ones. We want to place greater emphasis on machinery and automatic control equipment used in the chemical industry. We want to emphasize research on corrosion resistant and non-metallic material and equipment and thus progress in expanding non-metallic material's scope of usefulness in industrial chemical production; we want to assemble information on the requirements of various related fields and on the basis of these requirements manufacture certain new products on a trial basis, certain experimental chemical medicines are an example of this.

In the area of project planning we want to consolidate and improve the results obtained during the past three years, carry on our efforts to raise the quality of project planning and strengthen technical control; in this work, we want to place emphasis on the technical transformation derived from the mass movement for small scale foreign method production, on improving project planning derived from that movement and on helping small plants to achieve at the utmost speed a stable and high production of good quality.

The technological task in store for scientific industrial chemistry during 1961 is a heavy one. But the rich experience gained during the past three years has already laid a good foundation for the progressive development of technological work in scientific industrial chemistry. If only we continue to earnestly carry out the Party's general line under strong Party leadership, are determined to depend on the masses, firmly adhere to the principle of "wholeheartedly mobilizing the masses and subjecting everything to experimentation" in our industrial chemical

technological work, make strenuous efforts to strengthen our weaknesses and carry on without respite ---- then we can certainly gain a new victory on the foundation already provided by our achievements.

## MELTING ICE AND SNOW IN MOUNTAIN AREAS FOR IRRIGATION USE

/Following is a translation of an article by Yu Ting-hsuan, (余廷鍊) in Kuang-ming Jih-pao, 11 April 1961, page 2./

Personnel from the ice and snow utilization research corps of the Academia Sinica's Sinkiang branch and from related units on March 30th, began to go into such areas in northern Sinkiang as Hami Urumchi, Ch'ang-chi and Pa-yin-kou to expand such work as melting ice and snow in the high mountains and producing man-made rain for the purpose of serving agricultural production. Since last winter there has been little rainfall and high temperatures in various areas of northern sinkiang, in particular those areas along Lan-Hsin /Lanchou-Sinkiang/ railroad. And since these areas have again broadly increased the area of cultivated land, there has been a drastic increase in their water requirements. The research corps last year had already essentially finished gathering data on ice and snow in the T'ien Shan and had begun to grasp the laws governing the accumulation and melting away of ice and snow. This year, on this foundation, they have developed mass-character utilization of ice and snow. In areas along the upper reaches of the Wu-lu-mu-ch'i river, they have emphasized artificial ice melting and artificial rain making.

In other areas their main effort has been expanded in such activities as melting ice and snow, melting river ice, and in connecting bodies of water with parched areas. In addition to the research corps, personnel from such related institutions as the autonomous districts' meteorological bureau, the eighty-first agricultural college, the University of Sinkiang, the Sinkiang Normal College, research bureaus affiliated with the Academia Sinica, University of Peiping, the Hua-tung Normal University, and the Hua-tung water conservation academy, also joined in the work of melting ice and snow. Traces of glaciers of the Quaternary Period in the basin of the Min river are investigated.

The Quaternary Period glaciers research corps of the Ch'eng-tu Academy of Geology has discovered traces of glaciers dating from the Quaternary Period over a large area in the basin of the Min river in western Sze-ch'uan. This was done over a period of three months of study and investigation in the field and a considerable amount of data has been collected. Afterwards, three months of laboratory research was carried on and recently a scholarly thesis has been written on the

subject. According to the thesis, not only glacial periods existed, but also an interglacial period. The glaciers were not limited to mountain valleys but have already been found to have extended to areas in the plain in the form of an ice sheet. The thesis suggests that the geological formation of the area is related to the functioning of the glaciers. The thesis has taken a first step in resolving the problem of the formation of the plain of Ch'eng-tu and has also furnished valuable data related to construction, railroad construction, and hydro-electric engineering in the area.

and the first time I have seen it. It is a very large tree, and has a diameter of about 10 feet at the base. The trunk is straight and smooth, with a few small roots at the bottom. The leaves are large and green, with a few small flowers at the top. The tree is growing in a field, and there are other trees and bushes in the background.

REPORTS FROM THE JANUARY-MARCH MEETING OF THE PEKING  
ACADEMY OF GEOLOGY

Following is a translation of an article in Kuang-ming Jih-pao, 12 April 1961, page 1.

From January to March the Peiping Academy of Geology held its sixth meeting devoted to scientific reports and discussions. The two big specialized subjects, "the Earth's Structure in Regions of China" and "coordinated and rapid Mineralogical Surveys" formed the core of the reports and discussions. In period of over two months, reports and discussions were given on 29 subjects. These included aid to agriculture, speedy and coordinated geological surveys, geological theory, the development of new techniques and methods in geological science and the combination of hydrological engineering and geological theory. During the reading of the reoorts and the discussions, a first step was taken in earnestly and thoroughly carrying out the Party's policy of "letting the hundred flowers bloom together and letting the hundred schools contend" by comprehensively expressing different viewpoints and approaches and by giving individual opinions. A very lively atmosphere of free discussion and debate was thus created. In addition to large part of the Faculty and Student body of the Academy, representatives from relevant schools, colleges and scientific research units in Peiping also joined the meeting.

The "Earth's Structure in Regions of Chian" is a theoretical topic involving a synthesis of research on the laws governing geological structural development in China and their application in directing researches for mineral deposits. The history of this research is comparatively short and its objectives both big and complex. The viewpoints, methods, and techniques involved in various aspects of this research are not consistent with each other and differences of opinion are comparatively numerous. Teachers in the regional geological research division of the Peiping Academy of Geology have done systematic research based on rich data collected by students and faculty while they were engaged in productive labor in outlying areas during the past three years and have suggested some new points of view. In their report, "The Earth's Structure in Regions of China", they suggested that differentiation in the earth's structure had already begun as early as the Archezoic era, and that in that era comparatively stable blocks were already in existence. Although the area of comparatively stable units

was very small, they constituted the beginnings of the foundations of elevations in later eras. They call these "sprouts of elevations"; when they had passed through the movements in the earth's crust which took place toward the end of the upper Paleozoic era, they were gradually enlarged and formed the "original elevations". Because of this, they believe that the theory of "universal elevations" and "universal troughs" does not correspond to the actual process of the development of the earth's crust. The development of the structure of the earth during the pre-Cambrian period had its own peculiarities which differentiated it substantially from the post-Cambrian period. But there were those who believed, "the pre-Cambrian period was very ancient and it is still not possible to undertake a profound investigation of that period with present research methods and geological data. The foregoing points of view are somewhat premature and not necessarily reliable". There were those also who believed that "the universal troughs" and "universal elevation" theory was tenable. These divergent views were a result of differences in interpretations! Those who believed that the theory was tenable said, "universal troughs" refers to the widespread troughs in the Archeozoic era and the comparatively stable blocks were only their beginnings while in the main there were plastic and even soft transformations. The "universal elevations" refer to the tendency toward a general hardening of the earth's surface since the paleozoic era. The great majority of people present believed that at present there should be an active expansion of research on the earth's structure during the pre-Cambrian period, the direction of their research is correct, and that their terminology has great theoretical and practical significance.

The Faculty of the Regional Geological Research Section took as their point of departure the facts of the earth's structure in China and gave their points of view on such questions as the "Troughs in China---peculiarities of complex folds in the earth structure", "Structural features of elevations in China", "structural relationships between elevations and troughs in China", "features of fractures in regions of China", and "peculiarities of the movements of magma in China". For example, they gave a new rich content to the concept of "the structure of magma regions". They believe that in a region of magma structure there is produced a definite type of magma formation and also similar features of internal formation of mineral deposits. This is of great benefit to the studies of the laws of internal formation of mineral deposits. They also differentiated three basic types of regions of magma structure based on actual conditions in our country. These types are: the trough type, the elevation type and the peak type. Among these, the "regions of peak type magma formations" provoked the most vigorous debate from everybody. The majority of people agreed with what the report had to say on the peculiarities of the movements of magma during the Cenozoic era in the eastern section of our country but they did not agree to the naming of the "magma regions of peak type structure" because term is not included among the specialized terms dealing with the earth's structure;

furthermore the peak type of magma movement commonly recurs on different structural units of the earth and for this reason cannot be appropriately classed with the elevation and trough types. There were also those who believed that this is merely a problem of terminology and nomenclature; the point of view they have suggested is still correct. On the basis of a discussion in which all joined, they changed "peak type structure of magma areas" to "the structure of magma areas in the western Pacific" in order to more correctly express the features of geological structure in the eastern part of our country.

Debate also centered around the general laws of the development of the earth's crust. In respect to the question of determining the factors involved in the development of the earth's crust, the report suggested that the process of development of the earth's crust was an irreversible manifestation resulting from the mutual struggle between internal and external factors and from their interdependent functions. Among these factors, those performing the principal functions are factors of internal strength which in the development of the structure of the earth's crust are spatially always in a state of imbalance. Movements in the structure of the earth's crust are sometimes temporarily connected and sometimes temporarily disconnected, the combination of these spatial and temporal factors has formed the complex aspect presented by the structure of the earth today. During the course of the discussion, not a few people suggested that the internal and external factors should be clearly identified.

The report also suggested that the earth's crust is continually moving, changing and developing. As this process continues, different phases may be distinguished. Every phase of development manifests an accumulation of minute quantitative changes in the structure of the earth's crust. When a certain phase is reached it produces a qualitative change. This kind of qualitative change includes in part a good many still smaller phases of qualitative changes. Thus the opposed ideas of a constant development of the earth's crust and a phased development are unified. They applied this principle to the different phases included in a single process of development of elevations and troughs. Hence they suggested that the concept that elevations harden after being formed and do not change is completely mistaken. In fact, elevations like troughs are continually developing and different phases of development can be distinguished. It is necessary to discard the old and narrow concept of "elevations" and "troughs". There were those who suggested dividing the development of the structure of the earth's crust into three periods: a period of areas characterized by troughs, a period of areas characterized by elevations, and a period characterized by cavities. Furthermore they interpreted this as a general rule applicable throughout the development of the earth's crust; this developmental sequence would necessarily apply to all regions. Those giving the reports did not entirely agree with this point of view. They believed that in considering the spatially and temporally heterogeneous nature of the

history of the development of the earth's structure in our country that it was not possible to conclude that all sections of the earth followed a single sequence of development. They felt that we must admit the peculiar nature of the development of the earth's structure during the Cenozoic era in the eastern part of our country. This peculiar nature is a result of the peculiar structural position of the eastern part of our country (a belt bordering the Pacific Ocean) and is related to unusual depth of the structure. We must start with the facts and make concrete analysis. The development of the structure of the earth in different areas does not necessarily pass through the three phases enumerated above. Because of different internal contradictions in events and different conditions, the skipping over of developmental processes may take various forms. Sometimes the earth's crust passes through violent movements. Sometimes the changes are gradual; some areas pass through a new phase of activity in the Mesozoic and Cenozoic eras after having already passed through the phases of troughs and elevations; sometimes the trough phase is followed directly by new movements in the Mesozoic and Cenozoic eras; in some cases a stable phase of development is maintained without interruption, and so forth. The situations are different and cannot be arbitrarily categorized.

Of particular importance was the discussion in which everybody joined concerning the direction and method of research on the earth's structure. Everybody agreed that the study of the earth structure is oriented toward the laws of distribution of mineral deposits. The results of geological surveys are the standard for investigating the element of scientific truth in the research. In regard to research methods we must be guided by dialectical materialism; and taking factual data as a foundation, we must carry out both synthesis and analysis in our researches, making use of various results of modern scientific technology (such as geophysics, geochemistry and mechanics) in addition to general historical and structural methods of analysis. In addition, the problem of dividing units in the earth's structure in China were discussed.

The second topic of the discussion at the meeting was: "Concerning the Problem of Coordinating Broad Surveys". At the meeting the geological survey division gave a report entitled "Combining Surveys and Research and an Attempt to Discuss a Rapid and Coordinated System of Surveys". After the report, a vigorous discussion and debate ensued at the meeting.

In addition, lively discussions were held on "the problem of seeking kalium salt deposits for mining in our country" and "land formations which produce petroleum".

This meeting of scientific reports and discussions not only was helpful in raising the theoretical scientific level of Faculty and Students, in addition it revitalized the atmosphere of scholarship at the school and of learning among the students. After participating in

the meeting for scientific reports and discussions, a good many of the advanced students found their vision widened and their enthusiasm for studying scientific research and methodology stimulated. While studying, a good many of the students also assembled actual data obtained during their three years participation in productive labor. They undertook research over small areas, held scholarly discussions, and convened small scale meetings for the giving of reports

## THE AUTOMATIC ADJUSTMENT OF A GROUP OF PLANTS

[Following is a translation of an article by Huang Chi-fang (7806 4949 5364), Wu Chin-i (0702 6651 5030), and Lou Yung-hai (2869 3057 3189) of the Kwangtung Provincial Institute of Agriculture in Kuang-ming Jih-pao, Peiping, 25 and 26 April 1961, page 2.]

The discussion of the group concept of plants has been given much attention by the agricultural science field. This debate was aroused by an article, "The Group Concept of Plants in the Agricultural Production," written by Yin Hung-chang (3009 1347 4545), the deputy chief of the Institute of Plant Physiology of the Academia Sinica. Wu Shao-nien, (0702 3599 1628), the chief of the Agriculture Division of Hua-nan Agricultural College expressed a different opinion from Yin Hung-chang's article at a scientific discussion conference as sponsored by Kwangtung Provincial Association for the Dissemination of Scientific and Technical Knowledge in December of last year.

The central idea of Comrade Wu Shao-nien's opinion is to object to the viewpoint of the "automatic adjustment" of a group of plants and the contradictions and unifications between group and individual plants as advocated by Comrade Yin Hung-chang. Comrade Wu's opinion is that in recognizing the "automatic adjustment" of the plants, the important function of man's subjective mobility in controlling the growth of plants is neglected. The recognition of the contradictive relationship of the group and individual plants is to view the problem only basing on individual, and the opinion is to object to close-planting. The difference of their opinions is also due to the different viewpoints on sprouting.

We consider that the "automatic adjustment" of a group of plants and the contradictions and unifications between group and individual plants as explained by Comrade Yin Hung-chang expose the characteristics and development rule of group plants. At the same time, the explanation further reveals man's subjective mobility in controlling group plants. Comrade Yin's opinion coincides with the dialectic materialists' viewpoint of debate and proof.

### 1. The "Automatic Adjustment" and Man's Function

In group plants there exists an automatic adjustment characteristic. Except for the number of stalks, the automatic adjustment also affects the appearance and manner of stems, biological functions, and the automatic

adjustment functions of the various organs. Furthermore, the automatic adjustment also affects the important yield factors including the number of spikes, number of grains, and weight of grain. The automatic adjustment of plants is a kind of adaptation as developed by the systematic growth of the plants. If we consider the automatic adjustment to be the inherent character, human beings can do nothing about that without the function of subjective mobility. It is incorrect. In different surroundings, the plants have different appearances of growth for the adaptation to automatically adjust for the growth. We cannot consider that this adaptation is only the mechanical behavior of the plants in neglecting the important function of the automatic adjustment to the growth of group plants.

The increase and decrease of the stems of *Oryza sativa* plants reveal the automatic adjustment. Taking lowland rice as an example, in the initial stage of growth, there are fewer stems with good conditions of ventilation, light, and nutrition; the nourishment of the main stem not only satisfies the demand, but also has a surplus to help in growing the young sprouts. When the green surface of the group plants increases, but there are still plenty of spaces in the field to facilitate the process of photosynthesis, the nourishment is mostly applied to the young sprouts to speed up the sprouting to a peak. Afterwards, the group plants being to grow densely in the field to worsen the conditions of ventilation, light, and nutrition, and at that time the stem enters the growing stage of spikelets with the nourishment of the process of photosynthesis channeling to reproductive organs. Then the young sprouts die because of insufficient nourishment and the death rate increases as the progress of breeding increases.

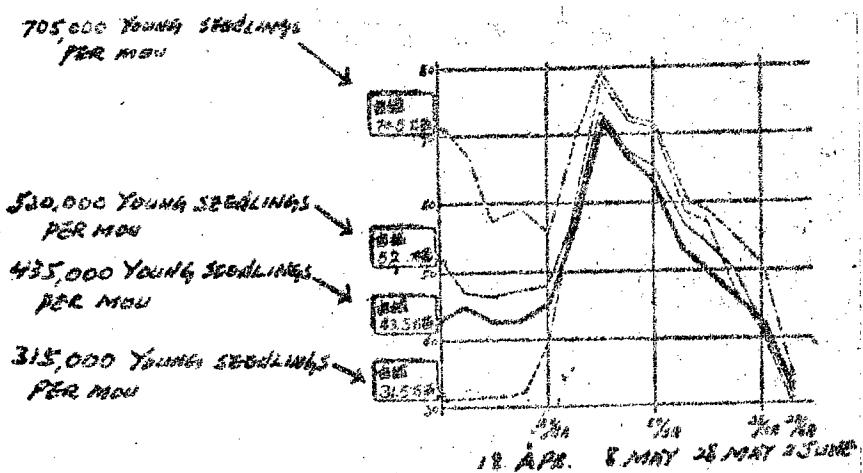
As a result of the dead sprouts, the group plants have better conditions for the process of photosynthesis and breeding surroundings, and the physiological process has a new balance to gradually stabilize the stems of the group plants. Actually, the increase and decrease of the stems are appearances of automatic adjustment of the nourishment and biology of the group plants.

We know when the normal growing conditions are not seriously obstructed, the stems of lowland rice always have a process of increasing and decreasing to stabilize the number of spikes at last. For instance, the Institute of Agriculture of the Swatow Special District engaged in the close-planting experiment of the early-grown rice in 1960. The experimental variety was low Nan-t'e. In an experimental field, the number of young seedlings per mou were respectively 315,000, 435,000, 520,000, and 705,000. The maximum stems in the growing stage had reached respectively 785,000, 745,000, 750,000, and 790,000. On 2 June, the number of stems were respectively stabilized at 307,500, 311,300, 322,500, and 356,300 as shown in Table 1.

Please see Table 1 on the following page.

Table 1. The curves of the increasing and decreasing of stems.

The close-planting experiment of early-ripe rice by the Institute of Agriculture of the Swatow Special District with Lew Nan-t'e as the rice variety at a planting distance of  $6 \times 2$  ts'un.



The number of young seedlings in another field were respectively 292,500, 461,300, 671,300, and 720,000 with the maximum stems reaching respectively 615,000, 572,130, 720,000, and 810,000, and the final number of spikes were 363,800, 361,900, 367,500, and 322,000 with yields respectively at 642.4 chin, 547.5 chin, 545 chin, and 507.5 chin as shown in Table 2.

Table 2. The Relationship between the Number of Young Seedlings, Number of Spikes, and Yield.

The close-planting experiment of early-ripe rice by the Institute of Agriculture of the Swatow Special District with Lew Nan-t'e as the experimental rice variety.

Please see Table 2 on the following page.

<u>Number of Young Seedlings Planted per Mou (10,000)</u>	<u>Distance in ts'un</u>	<u>Maximum Stems in Growing Stage (10,000)</u>	<u>Number of Spikes (10,000)</u>	<u>Yield chin/mou</u>	<u>Remarks</u>
13.5	3 x 5	43.2	31.80	618	Area with abundant fertilizer
16.4	"	56.4	32.60	625	
28.8	"	61.2	37.32	635	
39.2	"	67.2	38.40	610	
52.0	"	80.80	40.00	617.5	
14.8	"	38.4	28.60	566.25	
19.6	"	50.8	31.20	543.75	Area with average quantity fertilizer
27.6	"	54.2	33.46	590	
36.0	"	51.4	37.06	576	
44.4	"	71.2	37.32	550	
29.25	2 x 8	61.50	36.38	642.5	
46.13	"	72.18	36.19	547.5	
57.13	"	72.00	36.75	545.0	
72.0	"	81.00	32.25	507.5	

This doesn't mean that the number of spikes and yield have reached a maximum. Actually, the processes and adjustment scope of the increase and decrease of stems are different to different varieties, natural conditions, and cultivation conditions. The varieties of low stem type with broad leaves such as Kwangsi Ai-tsai-chan are supposed to have more accumulation of the photosynthesis nourishment in the main stem to supply the growth of the young sprouts. Therefore, there is an early stage of sprouting, stronger sprouting, and longer period of sprouting easily obtaining more spikes per unit area.

However, the high stem varieties with the big growth of the main stem need more photosynthesis nourishment with correspondingly less photosynthesis nourishment to weaken the growing of young sprouts. The different cultivation conditions in the different areas have the different sprouting characteristics of different varieties. Therefore, for the same variety, the different sprouting will result under different conditions. However, some people don't realize the objective reality of the sprouting of lowland rice under the high-yield cultivation in the abundant conditions of water and fertilizer. They singlehandedly adopt the close-planting to control the sprouting. The results are early stage of crowding growth to obstruct light and ventilation, the abnormal growth of the individual plants, the obstruction to the normal growth of the group plants to result in slim stems, early stage of falling down, and smaller spikes and fewer grains with a lower yield. The experiments have proved that under the conditions of abundant water and fertilizer, the attempt of controlling the sprouting by highly close-planting is impractical. This attempt is only a subjective imagination without the foundation of experimental result and production experiences in violating the objective rules without any help to the experiment.

The automatic adjustment of group plants is revealed by the trans-

formation of appearance of the planted stems. In the early stage of the growing of lowland rice, the stems are sparsely distributed, but at the later stage of the growing, the stems are increased with denser group plants in gradual concentration to the main stems. The group plants of sparse-planting have more concentration on the stem with a smaller angle between leaves and stem and narrower leaves because the group plants always tend to utilize the space as revealed in their automatic adjustment.

The number of leaves in the whole life-span of plants also conforms with the automatic adjustment. There are fewer leaves on the main stem in the close-planting lowland rice field. Taking the Low Nan-t'e rice variety as an example, the leaves on the main stem are around 12 if 200,000 young seedlings are planted per mou. The leaves decrease to around ten for 500,000 young seedlings per mou.

Undoubtedly, we still don't know much in the various revelations of the group plants in automatic adjustment. We believe that mankind will eventually grasp its rules following the advancement of the science and its techniques to utilize the advantageous side and control the disadvantageous side for higher and higher yields.

We acknowledge that the automatic adjustment of group plants can transform the conditions to promote and control the phenomena in serving mankind. For instance, Comrade Hung Ch'un-ying (3163 5028 5391) of the Chin-yu Commune in Ch'ao-yang Hsien of Swatow Special District has adopted the measures of promoting and controlling based on the strong sprouting and longer period of sprouting of the Low Nan-t'e variety. During promoting, Hung can create control conditions in previously achieving the motive of control in avoiding the emerging at an earlier stage of the serious "reversing the nourishment route." Hence, during the sprouting the effective sprouting rate is raised to achieve the increase of spikes in insuring the simultaneous good development of group and individual plants. Hence, Hung obtained high yield experiences three years in a row of more than 1,000 chin per mou. In 1960, Hung sowed the early-ripe rice young-seedlings of 240,000 per mou (san-chiao-yang including sprouting young seedlings) at the maximum stems in the growing stage of 460,000, effective spikes of 330,613 with the main spikes occupying 23.5% of the total spikes, and the number of sproutings in the field at 28.8% of the total spikes with a mou unit yield of 1,218 chin of dry paddy rice.

## II. The Advantages and Disadvantages of Sprouting (continuation from Kuang-ming Jih-pao, 25 April 1961.)

Comrade Wu Shao-nien considered that the sprouting was no good and he advocated a realization of the superiority of the main stem to object to the research of the utilization of sprouting. As Comrade Wu said at the science discussion meeting in Kwangtung Province in December 1960, "Some scientific workers always consider that the sprouting characteristics of lowland rice are the key to the high yield and dream at the research of the nourishment biological relationship of sprouts and the main stem. They are not interested in controlling sprouting in the close-

planting production. Does this kind of research coincide with the direction of the development of production?"

Although Wu declared that the sprouting cannot be considered as absolutely good or bad, yet from his viewpoint he considered the sprouting to be the absolute bad thing, at least during the stage of close-planting. Quoting his viewpoint, relying on sprouting or working on sprouting is "difficult to insure the planned effective spikes," and "relying on main spike, the effective spikes of a unit area can be easily achieved to the planned target." "The sprouting is negligible to the yield and effective spikes of the close-planting." We consider that on many sides the sprouting coincides with the economy requirement in struggling for partial-sprouting spikes or sprouting spikes. This is not "passive" and "relying on heaven" for productive conditions. Every time, the practice of production and the practice of high-yield field sufficiently prove this point.

Taking a look at the Kwangtung area, the Swatow Special District is the best known high-yield area of the whole country, and the yield of low-land rice mainly relies on sprouting or on sprouting spikes to a considerable ratio. In the areas of northern Kwangtung, Hainan Island, and Western Kwangtung with barren soil lacking the conditions of cultivating the sprouting spike, the main spike is relied on in these areas. The two special districts of Fo-shan and Chiang-men have conditions between the above extremities. From the high-yield concluding experiences (as in Table 3) of the lowland rice in the Swatow Special District in 1960, it can be sufficiently proved that the sprouting spike has the determining factor on the total spikes and yield.

Table 3. The Relationship between the Sprouting Spike on One Side and the Total Spikes and Yield on the Other.

(The high-yield experiment of early-ripe rice by the Swatow Special District in 1960 with Low Nan-t'e rice variety.)

% of Sprouting Spikes	85 - 75	74.9 - 65	64.9 - 55	54.9-45	Below 45	Total						
% of Experimental Fields	No. of Field	No. of Field	No. of Fld.	No. of Fld.	No. of Fld.	No. of Fld.						
<u>Yield</u>												
<u>Chin/mou</u>												
1000-1218	3	20.0	1	6.7	9	60.0	2	13.3	0	0	15	100
800- 999	0	0	12	41.5	10	34.3	6	20.7	1	3.5	29	100
600- 799	4	8.5	11	23.4	7	14.9	17	36.2	8	17.0	47	100
Below 600	0	0	2	12.5	3	18.7	5	31.3	6	37.4	16	100

From Table 1, the high-yield field has bigger ratio of sprouting spikes. For instance, the ratio of sprouting spikes is not less than 45% for the fields over 1,000 chin per mou of yield. For the mou unit yield of below 600 chin, it mainly relies on the main spike stem. In Comrade Wu's opinion, the increase of spikes only relies on more planting of

young seedlings, i.e., only relying on the main stems. This is a one-sided view. We acknowledge that the spikes not only rely on the planted young seedlings, but also rely on the variety sprouting and cultivation technique. If grasping the utilization and control techniques of sprouting, the fewer planted young seedlings can achieve high spikes and yield. For instance, in Table 3 the fields with a mou unit yield of over 800 chin have 300,000 to 350,000 spikes; however, the planted young seedlings are fewer than the planned spikes and mostly rely on the higher ratio of sprouting spike. This explains that in the high-yield technique, the sprouting is not negligible to the number of spikes and yield, and it is a consideration. In the high-yield experiences of Comrade Hung Ch'un-ying, this point is also proved. However, owing to condition limitations, the big field production cannot rely on too much sprouting. It has to suit special local characteristics and is not identical at any place. Otherwise, it will lead to the mistake of sparse-planting. However, we cannot take the attitude of Comrade Wu Shao-nien to absolutely deny the sprouting and its advantages and singlehandedly emphasize the control of sprouting, and object to the utilization of sprouting. We advocate the adoption of the method of combining a promotion and control of sprouting.

Except for the above fundamental points in this article, we further have different opinions to Comrade Wu's article in its example, proof, viewpoint, and estimation. For instance, Wu mentioned in his article that the Agriculture Division of T'ai-shan Hsien had a method applying to late-ripe lowland rice of 1959 in first adopting a small clearance between planting rows and later transplanting into a large clearance between planting rows to adjust the structure of the group plants capable of considerably increasing the number of spikes, grains, and the weight per 1,000 grains. The method is to pull out one-half of the rice stalks in the later stage of sprouting to transplant to other fields. Though this method can achieve a definite effect, yet at the present situation it cannot be applied in big fields because of too much labor needed. Even neglecting its practical value, there is still the question of whether a yield increase is possible or not. According to this method, in the later stages of sprouting of lowland rice, the young spikelets begin to sprout in about a half month's time. At that time, the rice roots are well grown and the soil is more solid than the time of planting of seedlings. The pulling out and replanting will hurt many roots, though later some new root sprouts to improve a part of the group plants structure. However, we consider that this method is difficult to simultaneously increase the three factors (number of spikes, number of grains, and weight of 1,000 grains) of yield. According to Comrade Wu's estimate, this method can increase 69,000 spikes at an increase of ten grains per spike and 1.2 grams of increase in weight per 1,000 grains. We can assume the minimum stems and compute:

<u>Before</u>	<u>After</u>
150,000 spikes	210,000 spikes (increase of 60,000 spikes)
10 grains per spike	20 grains per spike (increase of ten grains per spike)

We can get the conclusion that even without the consideration of

the increase of weight of 1.2 grams per 1,000 grains, and only considering 20,000 grains per chin, the increase of yield is 135 chin per mou. We think it is doubtful. If we are relying on this experimental result for important conclusions, this experiment must be made again.

At last, we have to point out that no matter whether you are peasants or agricultural researchers, the practice is to consider a field as the group plants. Before, we never computed the result by the yield of a single stalk and we always computed the result by the yield of a mou. However, we sometimes also make some other mistakes, i.e., we emphasized too much the yield of a lot of field and neglected the total yield of all the rice field. Originally, we had to consider that a single lot of field as the individual plant and all the managed field as the group plants. Among these lots of field, through the cultivation methods of the planter, they were organically interrelated. However, few researchers of us lack such conception of "the total plantation as a group of plants." Hence, they introduced some technical measures only suitable for the increase of yield of a lot of field or few lots, and not suitable to the management of the whole big field plantation to spend most of the manpower, material power, and the precious agricultural season to the few lots of field, sometimes resulting in the decrease of output of the "group plants of the whole plantation," i.e., regardless of the increase of total output. This conception of the group plants should be clearly introduced to crop cultivation and seed breeding. In our experiment and introduction of cultivation technique measures, we have to stick on this conception of group plants. Through review in recent years, the mistake of this conception appeared in a part of the cultivation technique measures submitted by us. Therefore, our proposals often could not be accepted by the commune members in decreasing the yield sometimes.

In the summer of last year, we went to the Yang-li Brigade in Hsing-ning Hsien to conclude the experiences of the increase of yield of lowland rice; there we deeply realized this point. Last year, their Ai-tsai-chan high-yield field had a unit mou yield of over 1,000 chin. When we discussed the technical measures of next year, there were two different opinions to preserving the effective spikes at 300,000 to 350,000 each mou. On the one hand, some technical cadres advocated that for insuring the number of spikes, there should be 300,000 seedlings planted. However, on the other hand, Comrade Ts'eng Hung (2582 5725), the brigade leader and also the agricultural labor model of all China, advocated to sufficiently utilize the strong sprouting characteristic of Ai-tsai-chan to only plant 150,000 to 200,000 seedlings with sprouting in the field to 300,000 to 350,000 spikes. Comrade Ts'eng's reasoning was to economize one-third to one-half of the seedling field. Thus, these economized fields could be used for production. Moreover, in the busy period of spring plowing, there can be decreased as much as hundreds in the labor force (generally, a brigade only has about 1,000 people). Furthermore, all the rice fields could be completed, with seedling planting matching the agricultural season, and the total output could be increased. We considered then that Comrade Ts'eng's opinion was correct. We can say now that he has the conception of consider-

ing the "whole plantation as group plants" in fulfilling the requirements of higher output.

Comrade Wu Shao-nien compared the yield of 610 chin in planting 150,000 seedlings, (per mou) and yield of 634 chin in planting 500,000 seedlings per mou (originally it was from the writing of Comrade Yin Hung-chang). Comrade Wu considered that the increase of yield of 24 chin should be emphasized. However, it is not our opinion. We consider that the increase of yield to 24 chin has many shortcomings. It will take 20 more chin of seeds, so actually there is an increase in yield of four chin, without taking into account that this figure is possibly an error in calculation. However, if it is really the increase of yield of four chin, there has to be an increase of more than two times of the seedling field at the rate of one mou to three and one-third mou. There will not only be an increase in the labor force, but also an increase in the seedling field resulting in a decrease of output more than four chin. Besides, we believe that many leaders of production brigades don't consider the planting of 500,000 seedlings per mou to be of any advantage. So those comrades emphasize that the increase of four chin may lack the conception of "whole plantation as group plants," or they haven't the viewpoint of total output. Hence, we clearly introduce this conception of group plants, or the viewpoint of total output, into agricultural work. It can remove the one-sided opinion for production reality and help to increase agricultural output. Under this conception, the cultivation experiment can be accurate, so it should be stressed vigorously.

In short, we consider that the crops have the characteristic of automatic adjustment and have to study and grasp its rules to further exploit our subjective mobility. Otherwise, if it violates the objective rule, the emphasizing of subjective mobility is of no use. The agriculture researchers have to get the conception of "whole plantation as group plants" and also the viewpoint of "total output" in regulating the experimental plan and introducing the measures of cultivation techniques.

THE DISCUSSION OF THE CONCEPTION OF GROUP PLANTS BY  
THE BIOLOGY DEPARTMENT OF NAN-K'AI UNIVERSITY

[Following is the translation of an article written by Chiang Che-shih (5592 0772 2514) in Kuang-ming Jih-pao, Peiping, 26 April 1961, page 2.]

The teachers and students of the Plant Physiology Section of the Biology Department of Nan-k'ai University have recently developed their learning and discussions to the conception of group plants in agricultural production.

In the discussions, based on their own study practice and realization, they basically agree with Yin Hung-chang's (3009 1347 4545) "conception of group plants," "group plants as a system capable of automatic adjustment," and the "adjustment of group plants as engaged through the phenomenon of 'reversing the nourishment route.'" However, they consider that such a kind of automatic adjustment has a certain scope and limitations. The scope and limitations are related to the various objective conditions of cultivation techniques and crop growth. They feel that Yin Hung-chang's research of the development of group plants has to start from individual plants with a certain degree of truth and a certain degree of deviation, because Yin neglects that the development of the individual plant has to be established on the insuring of the highest productivity of the group plants in conforming with the requirements of group plants by the individuals.

They agree with Wu Shao-nien's (0702 3599 1628) viewpoint of the individual development from the angle of group plants, and the individual development cannot rely only on the automatic adjustment of group plants and have to be estimated with man's subjective mobility. In obtaining the maximum economic effect of the high-yield crops, consideration should be given to both individual development and close-planting and not just one of them. However, the close-planting method of Wu Shao-nien is not coincidental to the economic principle in production.

As for the biological conception of individual and group plants, some comrades consider that both individual and group biology are activity rules in researching plant life. However, some comrades consider that the research of individual biology emphasizes the discussion of the internal organs of the biological process, the strength of the biological process, the process rules of the biological growth, and its reaction to the outside conditions. The research of group biology is mainly to start from the advance of the unit yield, to explore the various biological processes and the strength variation of the group plants, to research the various conditions

within and without in facilitating the group plants to achieve high yield and the rules to group plants.

Concerning the concrete difference between individual and group biology, some comrades consider that there is possibly the qualitative difference in the organs of the individual and group biology because in close-planting, the mechanical components such as fibers of the plants are weakened. For instance, in highly close-planting, maize cannot grow a grain spike. Limited by the present scientific and technical levels, there cannot be detected the qualitative difference of individual and group biological organs. The opposite opinion considers that there is no qualitative difference between individual and group biology. It does not reveal biological organs, but the particular biological rules of the group plants. They consider that the group consists of the individuals, and the biological organs of the individuals are also the biological organs of the group. The rational group structure should have healthy individuals. Hence, under the conditions of high yield, it is impossible for the group plants to cause the considerable variation of individual biological organs.

The qualitative difference between group and individual biology can be explained by the "reversing of nourishment route" phenomenon of group plants as submitted by Yin Hung-chang. For instance, the sprouting characteristic of lowland rice and wheat is that under the individual plant condition of sufficient water and fertilizer, the sprouting can be increased rapidly with the most of the sprouting being effective without the "reversing of nourishment route" phenomenon. However, in the conditions of group plants, there appears the "reversing of nourishment route" phenomenon to change the sprouting from few to more, and after reaching the peak, the sprouting number decreases to stabilize at a definite level.

STRESSING RESEARCH OF PLANT PHYSIOLOGY TO CONCLUDE  
THE EXPERIENCES OF HIGH-YIELD AGRICULTURE

[Following is a translation of an article by Liu K'eng (0491 4837), deputy chief of the Peiping Plant Physiology Research Division of the Academia Sinica in Kuang-ming Jih-pao, Peiping, 28 April 1961, page 2.]

Plant physiology is a science which studies the life phenomena of plants in dealing with the biological processes occurring within the plants, and in studying the relationship between the biology processes and living conditions to control the growth rule. Thus, man can change these processes at his wish to control the plant growth better in achieving the target of production increase.

Although it has been more than 40 years since the start of research in plant physiology, still plant physiology was regarded as a pure science before the Liberation and did not cooperate with production. In the 30 years before the Liberation, plant physiology progressed very slowly in our country. In the early years following the Liberation, under Party leadership, the capitalist research direction of science which separated it from production and practice was turned to emphasize that science has to serve national construction and theory has to be linked with practice. So the appearance of plant physiology in our country could then be changed.

In 1958, as pushed by the great leap forward of agriculture, the researchers of plant physiology went to the countryside to conclude agricultural high-yield experiences. The appearance of this branch of science was then entirely renewed. In spring of 1958 a vigorous debate developed. A few scientists deeply rooted in the viewpoint of capitalist thought, and capitalist scientific viewpoints, objected to going to the countryside, and doubted that the concluding of agricultural high-yield experiences could help develop plant physiology. They acknowledged that although the peasants had rich production experiences, yet the concluding of experiences could not develop scientific theory. Later, many facts proved that their viewpoint was wrong.

The Peiping Plant Physiology Research Division of the Academia Sinica has followed the Party's instructions of the route of scientific research, and the practical unification in research work in thoroughly executing the mass route to unify the old and young scientific researchers to conclude the agricultural high-yield experiences. We have achieved many significant merits in the three years. Through the cooperation of the Peiping Plant Physiology Research Division and the related scientific

organization, three work bases have been established at the Hsin-li-ts'un Commune in Tientsin, the Chung-te Commune in the east suburbs of Peiping, and the Liu-ying Commune in Shih-chai-chuang to research the production of lowland rice, wheat, and cotton in engaging high-yield experiments with the peasant masses under the leadership of the local Party Committee. At the same time, laboratory research has been intimately coordinated to analyze and advance the peasants' high-yield experiences to elevate scientific theories.

In the production of lowland rice, we have concluded the seedling breeding experiences of the Tientsin-area peasant masses to design with old peasants the improvement of seedbed seedling-breeding with a preliminary success to earlier sow the lowland rice in the Po-hai area to decrease dead and rotten seedlings. This research work has been paid attention by the Tientsin-area Party Committee and the masses for activity expansion.

In the work base of the Hsin-li-ts'un Commune, the scientific researchers have preliminarily concluded a series of theories of "coordination of grain and stem" for the production of lowland rice in the experiments with old peasants. This series of theories has a new recognition in the application of the "eight-character constitution" of agriculture, especially with extensive research of four characters of "management," "close," "fertilizer," and "water." On "management," owing to the execution of "three early" and "three timely," the disadvantageous factors of the natural conditions have been overcome in settling the foundation of deep plowing and careful cultivation. The "three early" is early to plow fields, early to plant seedlings, and early to apply fertilizer; the "three timely" is the timely supplementary planting of one seedling after another, the supplementary application of fertilizer upon fertilizer, and removing weeds and stirring the seedling soil. On "close" the adoption of the rational close-planting in suiting the main and sprouting stems in the locality and mutually emphasizing the main and sprouting stems; "fertilizer" is the control of the rules of yellow and black of the leaves of the rice plant, the growing grain and stem, and the coordination of grain and stem; "water" is skill with we have to control the principles of harmonizing water and fertilizer, and the contradictions of water and fertilizer with the adequate irrigating quantities of water. Thus, every sector of the growing rule of the lowland rice can be solved in achieving the stabilization of high yield.

In wheat production, the scientific researchers in the suburbs of Peiping have a clearer understanding to the degree of rational close-planting of wheat through high-yield experiments. They have clarified that the eight-character constitution of agriculture is a relationship of debate and proof, and we cannot consider "close" separately. We have done some exploration work in the relationship of the rule of the quantity of wheat sprouting, the relationship between the main stem and sprouts, and the control of winter sowing of wheat. This year we shall emphasize to conclude the experiences of transforming low-yield wheat fields into high-yield fields to seek the principal cause of the low-yield wheat in a part of the Peiping area and to explore the growing rules in transforming the

low yield of wheat to a high yield.

In cotton production, the fall of capsules and unopened flower buds is the key point in effecting the yield. In over two years we have concluded the results of the peasants' high-yield experiences and preliminary finds of a series of measures in breaking the "three barriers" and preserving the "three boll periods" of the cotton plant. This series of high-yield experiences has been gradually elevated to theories by our scientific analysis work. The so-called preservation of "three boll periods" is more bolls before "slight heat" and "great heat" (one-half and one month respectively after summer solstice), preserving bolls in "slight heat" and "great heat" (two solar terms), and struggling for more autumn cotton bolls. Thus, we can achieve the high-yield target of growing bolls in "slight heat" and "great heat" with bolls covering the middle stem of the cotton plant, and the full covering of autumn bolls for a rich harvest. The so-called "breaking three barriers" has the first barrier as the "foundation barrier" of "six early," i.e. the early plowing of fields, the early sowing of seedlings, the early medium plowing, the early selection of young seedlings, the early completion of selection of young seedlings, and the early killing of insects in carrying out early seedlings, complete seedlings, same height of seedlings, harmonizing of seedlings, and strong seedlings.

The peasants' measure and standard are "late first water irrigation" and "early second water irrigation." Through medium plowing, we can achieve the rational growth of seedlings. The second barrier is the "increase and preserve unopened flower buds and capsules" with light as the key point. The third barrier is the prevention of early declining of the cotton plant to full covering of autumn bolls. In preliminary research, before and after the cotton flower blooming is the key period of whether the high-yield can be achieved or not. We have to avoid the suspension of water irrigation and fertilizer application. Through the concluding of the peasants' experiences of high yield, we have a clearer recognition that in the growing stage of cotton, we can control the rational stem type, the coordinating balance of nourishment growing and reproductive growing, prevent the longer flower blooming at the early period and the early declining in the later period in achieving high yield. In the three factors of water, fertilizer, and light, which factor is dominant enough to cause the falling of bolls in "slight heat" and "great heat?" We have preliminarily concluded that "light" is the dominant factor. In avoiding the boll fallings in "slight heat" and "great heat," we have to seek the unification and contradictions between the processes of photosynthesis and respiration.

In the research of the "coordination of grain and stem" of the lowland rice, the increase and decrease of the wheat sprouting, and the rational stem pattern of cotton have greatly supplemented the scientific theories of plant physiology. This research work has provided many new contents in the relationship of plant growing and the forming of organs, in the relationship between nourishment growing and reproductive growing, and in the relationship between the rational big field activities and the utilization of light energy in the big field. Moreover, through the exper-

iences of our peasants' applying of organic fertilizers, our scientific researchers have ascertained the superiority of the organic fertilizer to the increase of crop yields. It is understood that the lowland rice can have a metabolism effect on methane in the organic fertilizer. This has opened a new route to the research of carbohydrate metabolism of high-class plants.

In the recent three years, under the Party's correct leadership, although the plant physiology research work has obtained many merits, yet it cannot be denied that in the work there exist many shortcomings and there is insufficient exploitation for the function of plant physiology to agricultural production. The capitalist scientific viewpoints of separating production and practice for purely theoretical science haven't been completely wiped out. These thoughts are still affecting the scientific researchers to a certain degree and are obstructing their better serving production. The great development of agriculture, especially grain, is the serious task of all the Party and all the people, so the current mission of the researchers of plant physiology is very tough. We have to firmly follow the Party's instruction to continuously learn from the peasants according to the principle of the eight-character constitution of agriculture to conclude the peasants' high-yield experiences and elevate them into scientific theories to command production and push the development of this branch of science.

On the one hand, we have to conclude the rules and theories of high crop yields, and on the other hand, we have to organize appropriate manpower to research in the transformation of low yield to high yield and the transformation of medium yield to high yield.

Agricultural production is a very complicated process. In the process, between the crops and environment, between individual plants and group plants, between the various organs of the individual plant, there exists the relationship of the contradictions, the unification of contradictions, and the transformation of contradictions. From these complicated living phenomena to the seeking of the objective rules, plant physiology researchers have to double their efforts in learning the natural dialectic materialism of debate and proof to improve their thinking method and to develop the spirit of "letting 100 flowers bloom." In concluding the experiences of high yield, we have to concretely attempt to carry out the "clear situation, great determination, and correct method." Under the Party's leadership and the glorious brilliance of the three Red banners, we, the plant physiology researchers, courageously march forward.

## THE VARIATIONS OF WORLD CLIMATE DURING THE PERIODS OF HISTORY

[Following is a translation of an article by Chu K'o-chen (4555 0668 2823) in Kuang-ming Jih-pao, Peiping, 27 April 1961, page 2.]

It is a long-debated problem whether there were variations of world climate during the period of history. To this problem, the disputes are not only among historians, but there are also different opinions among astronomers and meteorologists. From the 19th century to the early stages of the 20th century, some European astronomers and meteorologists, including A-la-ko of France and Fen-han of Germany, recognized that in the period of the past 2,000 to 3,000 years, there was no basic variation of climate on the Eurasian continent. So, only with climate record of 30 years in a place, the average temperature and rainfall can represent the standard situation of temperature and rainfall in the period of history in this place. However, in the recent 60 years, the climate records and their variations in the various places of the world have completely overthrown the incorrect theory of constant climate, which cannot stand through debate and proof.

T'u Chang-wang (3205 7022 2598), the chief of the Central Weather Bureau, published an article in the Jen-min Jih-pao on 26 January concisely narrating the problem of warmer climate in the 20th century. This problem is not only vigorously debated in the scientific papers in Europe and America, but also has caused the economic transformation of agriculture, forestry, ranching, fisheries, and transportation of some areas of the world.

This is more impressive in the high latitude areas on the variations of climate in the 20th century. From the 1870's to the 1930's the Mezen River area in the European sector of the USSR increased in temperature at an average of 1.6 degrees centigrade, and the northern limit of the tundra moved northward by some 40 kilometers. In 1893 to 1896, when Nansen, the Norwegian geographer, explored the North Pole, the thickness of ice caps in the Arctic Ocean was 365 centimeters. In 1937 to 1940, Hsi-to-fu of the USSR went to the Arctic Ocean and measured the ice thickness at only 218 centimeters in the same area Nansen explored. Because of thinner ocean ice, the summer navigation season in the Arctic Ocean was prolonged from three months around 1900 to seven months after 1940. The decrease of ocean ice is not only beneficial to navigation, but also has transformed the animal life in the territory near the Arctic Ocean by indirectly affecting the economic life of human society. From ancient times

up to 1930 the Eskimos on Greenland lived by catching seal-leopards. However, after 1930, seal-leopards did not come to this territory and were replaced by large groups of cod. So, for the last 30 years the Eskimos have lived by catching cod.

In the last 50 to 100 years, the snow-line of the world's high mountains and glaciers has retreated upward. These are popular phenomena. The big glaciers have shrunk, the small glaciers have disappeared, and the snow-lines have been elevated. From 1922 to 1946 the Lapland Glacier in Sweden decreased its volume by 70,000,000 cubic meters, and the Pai-lin-na-hsi Glacier in the Alps Mountains of Central Europe melted and disappeared. From 1902 to 1946 the Mo-erh Glacier in Alaska retreated 22 kilometers at an average annual rate of 500 meters. The glacier in Mt. Kenya near the African equator with an elevation of 5,200 meters has retreated so rapidly that it has lowered the lake level at the base of the mountain and caused the Sahara Desert to move southward at more than one kilometer every year. Recently, according to the reports of the Soviet exploration teams at the South Pole, the glaciers in the Antarctic Continent have also retreated.

The glaciers of Europe, Africa, North America, and Antarctica are retreating. The similar phenomena have occurred in Asia. According to the investigation of Hung-pao-te, the German natural scientist of the 1830's, the snow-line on the northern slope of the Himalaya Mountains between 31 to 32 degrees north latitude had an elevation of 5,067 meters; however, the measured height of the snow-line one year ago by the Shih Chan-ch'un (0670 0594 2504) mountain climbing team of our country to the Teng-chu-mu-lang-ma Peak was only 5,800 meters. In a span of 120 years, the snow-line was elevated 733 meters. The elevating of the snow line causes the lifting of the steppe line, forest line, and the limitation of mankind's plantation.

In recent years, the members of the glacier teams and the comprehensive investigation teams of the Academia Sinica everywhere saw the retreating phenomena of the glaciers in T'ien Shan, Ala Shan, and the Himalaya Mountains. Without any mark in the past, the speed of retreating cannot be estimated accurately. As reported by old peasants in Ku-cheng-tze (Kitai) of Sinkiang, "Forty years ago the nearby snow line in Bogdo Ula was 400 meters to the peak. Now, only the peak is snowy on summer days." This is a reference. But some of the other glaciers advance. According to the investigation of 318 glaciers in Europe in 1949 and 1950, 96% of the glaciers retreated, 0.5% stabilized, and the remaining 3.5% advanced. Few glaciers investigated by the glacier team of the Academia Sinica in Ala Shan and T'ien Shan advanced. Most of them retreated.

Starting in the recent 100 years, the retreating of the glaciers in the continents has added melted water to the oceans to elevate the sea level. According to the data of sea levels in the Atlantic Ocean, the Mediterranean Sea, and the Baltic Sea, ten centimeters have been elevated in the recent 100 years. If all the glaciers on the world's continents were melted, it is estimated that the sea level would be elevated by 80 to 90 meters. Then the big cities like Peiping, Shanghai, London, New York, and Leningrad would be submerged in the seas. However, we don't

have to worry about it since the climate variations progress like wave and spiral. It was so in the period of history or geology.

In the most recent period of geology, i.e., in the later glaciation period, there appeared four glacial periods and four inter-glacial periods in Northern Europe and America. Whether or not there were glaciers in China in the later glaciation period was a dispute in the past. However, through large-scale geological exploration and geographical investigation following the Liberation, it has been proved that in many areas of our country like North China, the Northeast, East China, T'ien Shan, and Ala Shan, there had been glacial and inter-glacial periods. In the later glaciation period, the climate was much colder than now. As estimated, the average summer temperature in Germany and France at that time was colder than now by eight degrees centigrade, and in the winter colder by 12 degrees centigrade. In the inter-glacial period the climate was similar or milder than now.

By the technique of the carbon 14 isotope in determining the age of rock, we have an accurate method of determining the deposits during the period of the later glaciation period, such as the ages of peat and fossils. Recently, the technique of the oxygen 18 isotope has further advanced the method of determining the sea water temperature when the sea sediment was deposited. In the time of the maximum expansion of glaciers, the sea level was scores of meters lower than now with the equator sea water temperature then around 23 degrees centigrade. In the inter-glacial period, the sea level was nearing the present one, and the sea water temperature at the equator was 28 to 29 degrees centigrade. In the Temperate Zone and semi-tropical zone, there were bigger differences of sea water temperatures in the glacial and inter-glacial periods.

As viewed by geologists, we are now still in the fourth inter-glacial period, which began as early as 10,000 years ago with little climate variations like waves with smaller amplitude. In some areas from the advancing and retreating of the glaciers in the high mountains, the variety-variations of animals and plants, the expansion and shrinkage of the lakes, and the written records in the period of history, we know the outline of climate variations in the recent 10,000 years. In Sweden, Norway, and Iceland in recent times, more glacier research has been conducted. We know from the research that the climate of the Scandinavian Peninsula and Iceland was mostly mild after the end of the glacial period at the time of 5,000 B.C. to 1,000 B.C. This was the golden period.

At that time, the snow line in the Hua-t'ai-na-cho-erh Mountain elevated to 1,400 meters above sea level. In 500 B.C., the snow line lowered at 500 to 600 meters above sea level. Later, in the period of the Roman Empire from 0 A.D. to 400 A.D., there was once a time of milder climate, but not long afterwards it became cold again. From 870 A.D. to 1,200 A.D. the snow line climbed to 1,100 meters above sea level. This is about the present height. Later, the climate turned colder again between the 17th century and 19th century, or what is called the "small glacial period" in meteorology. This was the coldest period after the glacial period in the Scandinavian Peninsula. In the recent 100 years, the climate has become

milder to restore the snow line in the mountains to 1,100 meters above sea level. In other words, there were three climate cycles in the Scandinavian Peninsula in the past 2,500 years, i.e., corresponding to the period of Ch'un-ch'iu and Chan-kuo, six dynasties to the middle years of the T'ang Dynasty, and the beginning of the Manchu Dynasty to the years of Tao-kuang in our country. There was colder climate in these three periods than now. But the two Han Dynasties, middle years of the T'ang Dynasty to the Northern Sung Dynasty, the Ming Dynasty, the climate was similar to now. Before Ch'un-ch'iu, the climate was warmer than now.

During the last 8,000 years the climate variations in western Europe have been very similar to the above-mentioned climate situation in northern Europe. The climate of western Europe is relatively mild and humid. In the glacial period, the glaciers only covered the northern part of the United Kingdom and western Europe. Therefore, the determining of the climate before the period of history is based on the remaining plant varieties of the ancient times in lakes and underground. Brookes of the United Kingdom researched the records of ancient Europe for the typhoons, severe winters, flood, and drought calamities, etc. He estimated that in western Europe in the periods of Chan-kuo, six dynasties, Southern Sung, the Mongol Dynasty, and the beginning of the Manchu Dynasty, the climate was colder than now, and in the periods of the two Han Dynasties, the T'ang Dynasty, and the Sung Dynasty, the climate was almost similar to the present time. Before Ch'un-ch'iu, the climate was warmer than now.

Professor Hsi-ni-te-ni-k'o-fu of the Leningrad Institute of Geography has done much research on the ancient climate of Russia. The Volga River area of southern Russia is often confronted with drought. His research work dealt principally with the variations of humidity in the Russian Plain in the past thousands of years. The research method starts from the elevating and lowering of the lake surfaces in the steppe areas of the USSR. From the research results of Professor Hsi-ni-te-ni-k'o-fu, there were also climatic variations of the steppe areas of Russia. The humid periods emerged at 5,000 B.C., 3,600 B.C., 600 B.C., and 1,500 A.D., with dryer periods between them. There were only 30 to 50 years of the humid-dryer cycles with the longest to 1,800 years. After the 15th century, the dry climate was dryer, especially after the 1860's up to now. Pai-hsin-ssu-chi of the Water Irrigation Weather Bureau in Leningrad did research starting with the collection of records in the Russian historical documents from the eighth century A.D. to the 19th century concerning the droughts, flood calamities, severe winters, lack of snow, and fierce winds. It was known that the climate in the Russian Plain also formed cold-mild cycles. From the 13th to the 15th centuries, the climate was colder with more calamities. From the beginning of the 16th century, the climate was milder. In the 17th century the climate was colder again. From the second half of the 19th century up to now the climate has been milder again.

Egypt (the United Arab Republic) is the country with the oldest history in the world. Though Egypt is situated at the eastern corner of the Sahara Desert, it has rich agricultural products because the Nile River, one of the longest rivers in the world, flows through its territory.

Every summer the flood of the Nile River brings in the mud which fertilizes the land. Moreover, the flood water can be used for irrigation. There are two big tributaries of the Nile River, the Blue and White Nile Rivers. The White Nile River originates in Uganda and Sudan on the equator with a climate of all-year rain. The Blue Nile River originates in Ethiopia, with a monsoon climate, rain occurring only between June and September. Since the merging of the Blue and White Nile Rivers, the Nile River flows northward to the Mediterranean Sea near Alexandria with only one more tributary. The flood period of the Nile River starts in June, causing an elevation of the water level, with the highest occurring in August and September and ending in October.

After the flood, the water of the Nile is maintained by the White Nile River, but the extent of the flood every year relies mainly on the Blue Nile River. Since ancient times, the field irrigation in Egypt has completely relied on the Nile flood in summer, so there were records in all dynasties for the highest and lowest water levels of the Nile River. The records were completely preserved in the periods of 641 A.D. to 1,480 A.D. with a part of the records preserved after 1,480 A.D. Since the river bed was raised by the mud sediment with different quantities of irrigation water in different dynasties, therefore, it is difficult to determine the quantities of rainfall in different dynasties from the water levels. However, according to the charts and tables made from the highest and lowest water levels of years, we can see that there are cyclic elevating and lowering of water levels with the periods from 30 years to 50 years. Geographer Professor Ho-ch'ai-ying of Cairo University wrote a book in 1955, The Climate and Plant Variations in the Sahara-Arab Deserts and Mankind's Adaptation. He pointed out that the territories of East Sahara and Arabia were more humid than now from the prehistorical era to the time of Christ. From the third to the sixth century, the climate was dryer. He quoted proofs of the many water-storing ponds on the edges of Syria during the Roman Empire. Moreover, some small mountainous countries moved their capitals upwards to the mountains.

Owing to the lack of historical records in South and North America, such is the case of the records to the advancing and retreating of glaciers and the rising and lowering of rivers. Concerning the climatic variations in the period of history, we can only rely on the study of the annual growth rings of the Giant Sequoia in California as a referencee. This sequoia has a long life and can live up to 3,000 years with a possible height of 100 meters. It can live in dry and semi-desert climate. Its speed of growth is very sensitive to the quantities of rainfall. From the thickness of the annual growth rings, we can determine the quantities of rainfall that year. This work has been carried out for more than 40 years. According to the investigation of the cross-sections of the 75 Sequoias in the Colorado Valley, it has been concluded that during the past 850 years, the 13th century was relatively dryer. The 14th century was comparatively humid like the period of 1905 to 1929, the last 25 years of the 16th century were very dry and even more than the dry periods around 1900 and after 1930 in North America. After 1670, the rainfall has formed cycles with periods

of 20 to 25 years. In the United States, the carbon  $^{14}$  isotope is also utilized to determine the retreating time of the glaciers from continents in the later glaciation period. From the result of investigation, the fourth glacial period of the later glaciation period had the maximum ice advance at the time of 35,000 years ago, with a sea water level of 120 meters lower than now. Until 7,000 years ago the glaciers completely retreated from the continents.

Now we return to Asia to talk about our neighboring countries, India and Japan, and the climatic variations in the time of history. In the past, the climatic variations occurred more in high latitude areas. For instance, the climatic variations in the recent 100 years were more impressive near the Arctic Ocean. In our country, more variations were in the northeast than in northern China, and more in northern China than the Yangtze River Basin and south China. However, in the Southern Hemisphere there existed the opposite tendency. For instance, between 1880 and 1950, the summer temperature in Australia (the summer in the Southern Hemisphere is our winter time) was not higher but lower.

India is situated in the tropical zone at low latitudes. According to the weather record of the various places in India in the recent 80 to 90 years, we know that in the recent 30 years the temperatures of the northern mountainous areas and the western coastal areas were higher than recorded in the end of the 19th century, but the southern areas like Madras were colder. The records of rainfall show similar variations. In the northern mountainous areas and the western coast of Assam State, there was more rainfall than at the end of the 19th century, but the Deccan Peninsula in southern India had less rainfall than at the end of the 19th century. From the records of temperatures and rainfall, India also has cycles of 30 to 40 years. Though India is rich with classic writings, yet in them few climatic facts were mentioned. According to Fei-t'o-ching, there were three periods of the ancient climate. In the initial period, it was milder with evenness of rainfall. After that was the period of abundant rainfall, which was succeeded by a dry period. It cannot be determined how many years of these periods there were, but they were estimated at 4,000 to 7,000 years ago.

In Japan the climate in the time of history was scarcely recorded before the T'ang Dynasty. Therefore, in the book, Climate of Japan, as edited by Wadatsu Shinfu and his associates in Japan, when we pick a chapter entitled, "Climatic Variations" we see that the facts mentioned in the chapter for the climates before the T'ang Dynasty were based on the situation in Europe. The cherry flower is the national flower of Japan. There remained in Kyoto the date records of court banquets among the blooming of cherry flowers at the Emperor's palace. As collected by Kogawa Shutoshi, he transformed the dates of cherry flower blooming into the Gregorian calendar. I list in the following the dates of cherry flower blooming in the various centuries of the Gregorian calendar.

Table 1 Follows.

Table 1. The Dates of Cherry Flower Blooming in Kyoto, Japan.

Centuries	9	10	11	12	13	14	15	16	17	18	19	1917	1953
Time of Recording	7	14	5	4	8	12	30	31	10	0	5	36	
Dates of Cherry Flower Blooming	11	12	18	24	15	18	13	18	12	0	12	14	7
Apr.													

From the figures in Table 1 we can see that in Kyoto, Japan, the spring arrived later in the period from the 11th century to the 14th century, especially the 12th century, which was the time of the Southern Sung Dynasty in our country. Kogawa Shutoshi also did research on the freezing periods of Shuhō Lake in Japan from the middle years of the 15th century to the present. It is proved that the climate of this area has been warmer since the 18th century. At the same time, Yamamoto Momonofu collected an 850-year-old cedar in Motoso, which is situated to the southwest of Nagano in Japan, for the research of annual growth rings. He proved the research result of Shuhō Lake and its climatic situations. From weather records of the recent 100 years in Japan, the lowest temperatures occurred around 1900, with gradual rising afterwards, especially in the summer.

However, the different areas still had some local fluctuations. As to the seas surrounding Japan, some people considered that impressive variations have occurred since the glacial period. According to the proofs in geology by Professor Isoki of Nagoya University, the sea level surrounding the Japanese Islands was lower in the glacial period than the present level by 60 to 80 meters, and 6,000 years ago the level was lower than the present by 10 to 15 meters. Until 3,000 years ago the level was lower than the present one by three meters. Until 200 A.D., the sea water level stayed at the present situation. If this is true, the fact coincides with Chinese history. As recorded in Yu-kung of Shu-ching, Emperor Yu dredged the Yellow River to the sea at Chieh-shih. In the paragraph of Tu-shiu in Shui-ching-chu, "Chieh-shih Shan was situated in the western area of Liaoning and to the south of Lin-yu, and was submerged in the sea." The recording is then with foundation.

The above-mentioned materials are the climatic situations of the world's countries before the time of history and during the time of history. We can see that the climate varied universally at a definite rule, which is neither constant nor variable on straight-line advancing or lowering. Then, in Chinese history were there climatic variations?

On this problem some philosophers and literary scholars in our ancient times had paid due attention. For instance, Chin Lu-hsiang (1232 A.D. to 1303 A.D.) of the Mongol Dynasty made a conclusion based on the phenomena of the times and seasons for things in our central plain in Chou and Ch'in Dynasties. He recognized that in ancient times it was warmer

than in the Mongol Dynasty. In the beginning of the Manchu Dynasty, Liu Ting-hsien (1648 to 1659 A.D.) of Ta-hsing, wrote Kuang-yang Stories. In them he mentioned that he had collected the flower blooming times of the various places in the ancient and present periods to compare the temperatures in the time of history. However, his records were lost.

In recent times this problem has also been researched by some people. However, there were few written articles about that. Thirty years ago Professor Meng Wen-t'ung (5536 2429 6639) (presently lecturing at Szechuan University) wrote several articles in the Shih-hsueh magazine and the Yu-kung semi-monthly to try to prove that in ancient times the climate of the Yellow River Basin was like that of the present Yangtze River Basin. At the same time, Professor Hu Hou-hsuan (5170 0624 1357) (presently lecturing at Fu-tan University) wrote an article, "The Climatic Variations and the Discussion of Climate in Yin Dynasty," to try to prove that the climate of An-yang was warmer than the present time by basing on the materials obtained in the graves of Yin Dynasty. Recently, Professor Wen Huan-jan (2429 3562 3544) of Fuchow Normal College published a book, The Climate Research of the Middle and Lower Streams of the Yellow River in the Ch'in and Han Dynasties. From the facts collected, he has proved that there was no climate difference in the middle and lower streams of the Yellow River in the Ch'in and Han Dynasties than there is now. We know that the climate variation go up and down like waves. It was so in the time of geology and in the time of history. Then, in the times of the Ch'in and Han Dynasties, the climate of the Yellow River was the same as present, but in the times of the Yin and Chou Dynasties the climate was warmer than that of present. There is no contradiction between the two and coinciding to the variations of European climate as stated above. However, all the above-mentioned writers haven't considered the causes of the climatic variations to simplify the climatic changes. Actually, the cycles of climatic variations can be taken as periods of two to three years, 11 years, 30 to 50 years, 80 years, 150 years, and 1,800 years. With the longer period of the cycle, the bigger variations there will be. So, climatic variations are not so simple as imagined.

Thirty years ago the writer made historical statistics for the flood and drought calamities of 18 provinces in our country, and concluded preliminarily that from the Three Kingdoms to the beginning of the T'ang Dynasty (fourth century A.D. to seventh century A.D.) it was comparatively dry. In the dynasties of the Southern Sung and Mongol (12th century to 14th century) it was comparatively humid. In the Ming Dynasty (15 century) it was dry again. In the Southern Sung Dynasty (1131 to 1260), comparing with the spring snowing days of the capital, Hangchow, with that of the

1910's, I reached the conclusion that the last spring snowing in the Southern Sung Dynasty was three weeks later than 1910's, and the temperature in the Sung Dynasty could possibly be lower by one degree centigrade than the beginning of the 20th century. My assumption is just coincidental to the declaration of Kogawa Shutoshi of Japan in the cherry flower blooming time in Kyoto in the 12th century with its especially delaying. In the dynasties of Sung and Mongol in our country, it was especially cold in

the winter time because in the history the ice and snow calamities occurred an excessive number of times. This fact was also revealed in the historical documents of Europe as the following:

Table 2. The Severe Winters in the Different Centuries in China and Europe.

Century in Christian Era	6	7	8	9	10	11	12	13	14	15	16
Times of Severe Winter											
China	19	11	9	19	11	16	24	25	35	10	14
Europe	-	-	-	11	11	16	25	26	24	20	24

We bring forth a problem that in our history, are the recorded big droughts, big floods, bitter cold, fierce wind and snow true? Were there other reasons for attempting to decrease and evade the taxes or for the charitable funds in exaggerating the severity of the calamities? Of course, there were some incorrect instances, so we have to select the records properly. However, some people consider that it was entirely fictitious records in our history for the times of calamities and population census. This opinion minimizes too much the importance of our historical records. At least, this attitude is not serious enough to our history, which was a continuity of more than 2,000 years. These materials not only are precious information for today's scientific research, but also can render great assistance to our current socialist construction.

After the Liberation, with the collecting of the historical information of earthquakes in our country, they have become irreplaceable and are now basic references for heavy industry construction in our country. We have the most complete historical records of astronomy and weather. In 1682 the discovery of Halley's Comet, the well-known astronomer Halley of England computed its orbit and felt that it was similar to the comets of 1607 and 1351. So, Halley concluded that these are the same comets with a period of 76 years and six months. Hence, he traced the comet records in European history up to 189 A.D. only (the third year of Yung-hsi of T'ai-tsung in the Northern Sung Dynasty). He could not trace the records any earlier due to its incompleteness. However, in our history the information of Halley's comet could be traced to as early as 240 B.C., the seventh year of the first universal emperor of the Ch'in Dynasty. Each time there was not only the recording of the emergence of Halley's Comet, but also the recording of the direction and degree in the ecliptic circle. With this information, we can compute that in the Han Dynasty the orbit of Halley's Comet with the ecliptic had a difference of eight degrees compared to now.

There was also abundant weather information in our history to be discovered. In examining the climatic variations in our history, we have to use a method of determining the standard of climate in every period. There was no thermometer in ancient times, and the rain-gauge was popular

only during the Ming Dynasty, so we haven't much information available. However, we have a knowledge of Wu-hou (the times and seasons for things) which can be used to measure the climate in ancient times. In our avalanche of classic books, there were great quantities of Wu-hou knowledge. In our ancient times the people greatly loved nature, and especially the poets and scholars close to the laboring masses praised the times and seasons for things.

Here we have to explain what is called solar term and hou, and what is called the Wu-hou. Though the ancient ruling class used the Lunar Calendar, and in the ancient books, the so-called Hsia-cheng, Yin-cheng, Chou-cheng were all in Lunar Calendar. However, our laboring masses in the dynasties of our country used the Gregorian Calendar because in the struggles with nature they had to use the Gregorian Calendar for the cultivation and harvesting of grain, and the husbandry and breeding of animals. These things should be determined by the period of earth revolving around the sun; they are not related to the moon. In the period of Western Chou (1122 B.C. to 771 B.C.) they already knew that the length of a year was 365 days with determining of summer and winter solstice as well as vernal and autumnal equinox in a year. Until the beginning of Ch'un-ch'iu (around 665 B.C.) except for the vernal equinox, autumnal equinox, winter solstice, and summer solstice, there were added four solar terms of spring begins, summer begins, autumn begins, and winter begins. Until the transition period of the Ch'in and Han Dynasties (250 to 200 B.C.) there were already 24 solar terms. In the last years of the Western Han Dynasty (by the time of Christ), in the writings of I-chou-shu, there were already determined five days as a hou and three hou as a solar term. Thus, there are altogether 72 hou in a year.

In every hou there are determined the Wu-hou, such as "the peach growth is started in the time of 'excited insects,' five days later the oriole is singing, and another five days the eagles are transformed into pigeons." At that time, the laboring masses had limited knowledge of the life of creatures and plants. Pigeon is a kind of seasonal bird coming in spring and leaving in autumn, but the ancient people mistakenly considered that the eagle was transformed into a pigeon in spring. So we can correct these mistakes. However, their knowledge was derived from the practice, and the periods of time they determined are mostly reliable. In Western Europe there is still now the four divisions a year of summer and winter solstice as well as vernal and autumnal equinox and not 24 solar terms. The science of Wu-hou (the times and seasons for things) was established in Western Europe only in the middle of the 19th century, so our ancient peasants in the recognizing of processes of nature with the accumulated knowledge of the times and seasons for things were far ahead of the European people.

The knowledge of Wu-hou was not, as most people think, created by the poets and scholars in enjoying the moon and flowers. The knowledge is needed by the laboring masses for production, and was established by years of accumulated observation. It is a native knowledge of our country. After the establishment of the 24 solar terms in a year, the peasants can

know from their own experiences, that even at the same solar term there are still temperature differences and the agricultural seasons for different crops and vegetables. These Wu-hou are more reliable than solar terms. As considered by the peasants, the Wu-hou knowledge is the compass of the agricultural seasons.

In the Main Points of Ruling People written by Chia Ssu-hsieh of the Northern Wei Dynasty, it is the most systematic and comprehensive book containing the agricultural scientific knowledge. In the first chapter of this book it states, "The important point of plowing is the understanding of the seasons....When the apricot flowers begin to bloom, the initial plowing of the soft and barren soil is necessary. Until the falling of the apricot flower, then you can plow again." Here, Chia Ssu-hsieh wrote down the best time of plowing the various crops by the phenomena of the times and seasons of things. Until now, the old peasants in North China still know the sayings of "plant the cotton when the plum tree is sprouting." These sayings have been propagated for hundreds of years. Until the emergence of the eight-character constitution of agriculture, they then gave up the superstition of adopting the method of "early plowing the field, early sowing, and early planting of seedlings." However, the knowledge of Wu-hou still has its value. The knowledge is different in different localities and in different times. In the ancient times without the thermometer and rain-gauge, the knowledge could show the comprehensive climate at the particular locality and time. Hence, only if we have the Wu-hou records in the various dynasties can we estimate the climate of a particular locality then. Therefore, the records in ancient ages of times and seasons of things are the most precious materials in researching the climate of ancient times.

Where are the Wu-hou records of our ancient times? They are everywhere in the classic books of Ching, Shih, Tzu, Chi. In the diaries and travelling stories after the T'ang and Sung Dynasties, there are many of these precious materials. Chu Hsi of the Southern Sung Dynasty made a study on the diary of Lu Tsou-ch'ien. "He wrote without skipping a day. Even the warmth and cold of climate, the growth and fall of weeds and woods, he wrote down." There were thousands of poems by the famous poets in the T'ang and Sung Dynasties such as Tu Fu, Li Po, Su Tung-p'o, and Lu Fang-weng writing in their poems the Wu-hou information.

In the seven character poetry of Su Tung-p'o, "The white pear-flowers bloom with the dark blue willow. When the willow catkins fly the flowers are growing to cover all the city. I was in sorrow to see the snow before the east railing. How many times a man can spend the 'clear and bright.'" (One of 24 solar terms in a year.) According to this poem with information of place and time in the lunar calendar, we can know the times and seasons of plants at that time. Of course, the poems are highly artistic, and the great poets cannot be viewed by ordinary people. For another instance, in the "Walking under the Old Cypress" by Tu Fu, "The melting frost around the tree trunk is as big as the length of 40 men with the black trunk ascending skyward to 2,000 ch'ih." This is the view of nature by the artist. In the famous lines of Li Po, "The

turbulent river drops by 3,000 chang. I doubt that the Milky Way is dropping from the ninth sky." This is the description of nature as heaven. We have to realize that this is an artistic style of writing. However, the poems of the ancients described the landscape then. If writing nonsense, how could they become good poets?

We can make another instance as an explanation. From the plants, birds, and times and seasons of things in the poems, we can know the difference of climate in a locality between ancient and present times. In the "writing notes" made by Lu Fang-weng quoting Tu Fu's poems, "In the Hsi-p'u-tao of the south capital (during the T'ang Dynasty the south capital was Chengtu) by the fourth moon when the apricot is ripe, we can see the continuous water flowing in the Yangtze River with the monsoon fine rain...." Lu Fang-weng pointed out that this poem of Tu Fu was written in Chengtu. However, in the Southern Sung Dynasty there was no spring monsoon rain in Chengtu. Only in autumn Chengtu had monsoon rain like that in southern Kiangsu. So Lu inserted a question of "whether there was climatic variation between the ancient and present time." We know that in the spring, only with the shifting of the low atmospheric pressure to the west by several degrees of longitude, Chengtu would have monsoon rain in April. In the long period of climatic variations, it is very possible.

In determining the climatic variations between the ancient and present times by Wu-hou, we not only have to know the Wu-hou in the various places in the ancient time, but also in the different places at the present. We still haven't developed the Wu-hou observation. Wu-hou is different from agricultural climate. The agricultural climate records the situation of the cultivated crops. Wu-hou records the variations of the animals and plants in the different times of a year such as the starting and ending of the "excited insects" and winter sleeping, and the beginning and ending of the ice, frost, snow, and freezing. By the forecast of agricultural seasons, Wu-hou and the agricultural climate are similarly important. It is another problem to determine the climates in ancient times.

Let us take Peiping as an example to have a look at Wu-hou. The most important time of agriculture is the spring of the year, so Wu-hou in spring is the most important. Since the warm east wind melts the ice and the good earth enters spring, nature seems to wake up from dreaming with the blooming of hundreds of flowers and the singing of birds and worms at a definite order like a well-composed symphony to play a definite melody. Nature acts as the conductor of the orchestra. When its stick points to this place, the flowers have to bloom, and the birds have to sing. It is a very strong continental character of Peiping's climate. The spring is very short like a quick melody. The following Table 3 can be considered as the melody placed by nature in Peiping for 11 years. Once we have such data, we can use it to measure and estimate Wu-hou in Peiping in the dynasties of Sung, Mongol, Ming, and Manchu.

Table 3 Follows.

Table 3. The Spring Wu-hou in Peiping in the Past 11 Years.

	1950 Mo./ Day	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Melting at the Frozen North Sea	-	3/16	3/10	-	3/15	3/29	3/24	3/18	2/24	2/29	
Hilly Peach Flower Blooming	3/26	3/28	4/1	3/24	3/29	4/6	4/6	4/6	4/2	3/23	3/24
Apricot Flower Blooming	4/1	4/6	4/4	4/5	4/5	4/8	4/12	4/13	4/6	3/27	3/31
Apple Flower Blooming	4/11	4/14	4/11	4/13	4/13	-	4/14	4/19	4/14	4/3	4/8
Pryus spectabilis Blooming	4/13	-	4/18	-	-	4/22	4/27	4/23	4/23	4/12	-
First Sight of the Swallow	4/21	-	4/14	4/23	-	4/12	4/20	4/23	-	4/19	-
Flying of Willow Catkins	4/29	-	5/6	4/26	4/29	5/3	5/9	5/4	5/2	4/24	-
Ash Tree Flower Blooming	-	-	5/10	5/9	-	5/6	5/14	5/9	5/12	-	-
First Singing of Goatsucker	-	-	5/12	5/19	5/19	-	5/25	5/22	5/27	-	5/23

We can see from Table 3 that in the 11 years, the early and late of Peiping's climate have an appreciable variation, especially with late Wu-hou in the years of 1956 and 1957, and early in 1959 and 1960. In the last two years, the melting of the North Sea ice started earlier by one month than that of 1956 and 1957. The flower blooming of peach, apricot, apple, pryus spectabilis, and willow were earlier by ten days to two weeks than that of 1956 and 1957. As for the coming of the swallow and the goatsucker, it was affected by the climate along the flying journey and not by the climate of a single locality. This year the melting of the North Sea ice was on 3 March, and the blooming of peach and apricot flowers was earlier than the two years immediately before. If it is not exceptionally cool in the season of flower blooming, it is estimated that the flowers blooming of apple and pryus spectabilis are earlier than before.

Generally, people consider that the early and late dates of the flower blooming in the spring are affected by the temperatures of last winter and the current temperature. Although the accumulated effects of temperature are important, yet they are not the sole factor. Besides, the thickness of the snow, the temperature of the soil, the strength of the sunshine, and the different wind classes also have effects on flower blooming time. In last winter between December 1959 and February 1960, the average temperature was almost similar to that of 1956, but the timing of Wu-hou was much different. The winter of 1955 was the coldest one in the south of Yangtze River with many dead, freezing economic crops in Kwangtung and Kwangsi. In the east of Chekiang, the oranges of Ch'u-chou and Huang-yen also were confronted with the calamity of freezing. Although there were lower winter temperatures in Ch'u-chou than Huang-yen, yet the

freezing damage of oranges in Ch'u-chou was not so serious as in Huang-yen. We later knew that there was more rainfall in Ch'u-chou than at Huang-yen in that year with a higher humidity.

We have the records of Wu-hou of 11 years in Peiping, so we have a small rule to measure Wu-hou in ancient Peiping. However, for the comparison of Wu-hou between ancient and present times, we have to know firsthand the standard terms of Wu-hou. For instance, as written in "seasons book," "The beginning of blooming of Tao," which denotes the present hilly peach flower and not the peach flower as interpreted from the character, "Tao." The blooming of hilly peach flower is before that of the apricot flower, and the blooming of the peach flower is after that of the apricot flower. Besides, the dates of the Lunar Calendar have to be transformed into the dates of the Gregorian Calendar. However, in ancient times both the Lunar and Gregorian Calendars were used. If some people say, "Today is the 'clear and bright' in the Gregorian Calendar," it doesn't make any sense. As recorded in the ancient books, sometimes there were only the months of the Lunar Calendar. For instance, in the Pin-feng of Shih-ching, "in the eighth moon, the plum can be eaten. In the tenth moon, the rice can be harvested." Though this is the poems talking about Wu-hou, we cannot base it to determine the earlier or later Wu-hou compared with now since it recorded the Lunar Calendar. In the Lunar Calendar there are great differences of the solar terms every year. For instance, the "bright and clear" of this year was on the 20th day of the second moon according to the Lunar Calendar, but the "bright and clear" next year will be on the 11th day of the third moon. Therefore, the Gregorian Calendar should be the standard of Wu-hou.

Kuang-ming Jih-pao, 28 April 1961, page 3.<sup>7</sup>

Peiping was the capital in the three dynasties of Mongol, Ming, and Manchu with the concentration of learned people. From this period there remain many diaries, poems, essays, stories, and official documents. After the Liberation the various units of history, literature, water utilization, medicine, and agriculture have regulated our historical inheritance of the various branches of science. In the suburbs of Peiping, through archaeology we discovered many facts new to the people. These are materials of Wu-hou for the climate research in the time of history of our country. Since the 21st year of Tao-kuang (1841 A.D.) the observatory in the Russian Church had climate records. In the above-stated paragraphs, T'u Ch'ang-wang made conclusions concerning Peiping's climate in more than 100 years recently. In this period, the climatic variations were not appreciable.

However, before the 19th century what was the climate in Peiping like? In the 17th and 18th centuries in Europe there had been a cold period of "small glacier." Did Peiping also have this phenomenon? We try to take an instance in the second half of the 17th century. From the recorded Wu-hou in the ancient books at that time, we can determine whether Peiping was colder than now or not. In the beginning years of the Manchu Dynasty, a patriotic historian, T'an Chien, wrote a book entitled The Travel to North. In this book we know that he started in the end of July of 1653 (the tenth year of Shun-chih) from his native city, Hangchow. He

boarded a ship to Peiping by way of the Grand Canal. He arrived at Tientsin on 7 November, but the canal was frozen on 18 November. So he went by land to Peiping. He stayed in Peiping until March of 1656 (the 13th year of Shun-chih). By 7 March with the melting of the river ice, he then could board ship back to the south. If we take the above-mentioned canal freezing time as occurring in the same winter, we obtain the freezing time of 110 days. Comparing this 110 days with the present freezing time of the canal between Peiping and Tientsin, we can easily know that at the time of T'an Ch'ien, the length of freezing time of the canal was longer than that of the coldest winter of the recent ten years in 1957, as shown in Table 4.

Table 4. The Freezing Time of the Grand Canal between Peiping and Tientsin.

	<u>Start to Freeze</u>	<u>All Melting</u>	<u>Period of Ice</u>
1955-1956	20 December	18 March	88 days
1956-1957	7 December	28 February	83 days
1957-1958	2 December	6 March	94 days
1958-1959	27 December	7 February	42 days
1655-1656	18 November	7 March	110 days

In the period of T'an Ch'ien's stay in Peiping of two and a half years, he wrote in his diary almost every day, but he made few Wu-hou records. Only three times, he went to Pao-kuo Temple to see prysus spectabilis flower and once he saw cloves. If transforming the dates mentioned in his diary into Gregorian Calendar to compare the blooming of prysus spectabilis flower in Peiping of the recent 11 years, we know that the flower blooming was seven or eight days later than now. We know that the flower blooming of Peiping in the 17th century was later than now.

In the diaries of T'an Ch'ien, he mentioned that in the winter of 1654 (the 11th year of Shun-chih), there was a severe winter in Kiangsu and Chekiang. In November of that year the ice thickness was more than three ts'un in the Grand Canal near Wu-chiang. He made the trip by boarding a lightly-loaded ship and by hiring strong men to dig the river ice, then he could make the trip in about three or four li every day. The canal was frozen from Wu-chiang to Chia-hsing. It was a very peculiar thing that in November of the Gregorian Calendar, the South Grand Canal was freezing.

We can also prove the coldness of the Yangtze River at that time by the "Yueh-shih-pien-li" as edited by Yeh Meng-chu at the end of the 17th century. He wrote, "The orange and pumelo in Kiangsi Province were from ancient times the native products. These oranges were not only extensively planted in the mountains, but also in the gardens of every household and village for the entertainment of guests. Since the severe winter of 1654, (the 11th year of Shun-chih and also the year of Chia-wu) and the following spring, all varieties of oranges and pumelo were dead since few people planted them. Even if some people had planted them, these oranges were dead in the succeeding severe winters. On the first day of the 12th moon

of the 15th year of K'ang-hsi (1676) it was very cold and the planted fruits froze. So people never planted again." The orange and pumelo of Kiangsi were well-known from the T'ang Dynasty to the Ming Dynasty as the gifts presented to the Emperors. But in the later period of the 17th century, for over 20 years the orange trees were often frozen to death in the severe winters. So the peasants never planted again. We know from the above that in the second half of the 17th century there was a cold period in north China and the Yangtze River Basin as in Europe.

How long did the cold period last in the lower stream of the Yangtze River? Without the long-time recordings of Wu-hou, we cannot answer this problem correctly. We get information in the life story of Liu Chi-chuang (1648 to 1695) as written by our geographer Chuan Tsu-wang (1705 to 1755). Chuan quoted Liu's words, "There are in different places the 72 hou of a year such as in the tenth moon, the prune flowers bloom in Kwangtung and the peach and plum flowers are blooming in the 12th moon. However, in Kiangsu the prune flowers bloom in "excited insects" and peach and plum flowers bloom in "clear and bright." It is very different. The traditional 72 hou were from "seasons book" which was the climate in the central plain in Chan-kou of Chou Dynasty. The climate variations of the central Chinese plain between Chan-kou and now are because of the years of difference. I then carefully investigated the climate in the south and north and carefully recorded it. In handing this down to future generations, the climatic variations can be detected." From his words we can see that Liu Chi-chuang not only knew that there were different Wu-hou in the south and north, but also he doubted that the climate would be different in the different periods of history. From his Wu-hou information, we can know different Wu-hou between that time and now.

In the period of ruling by the Kuomintang reactionaries, the Institute of Weather Research collected the reports of the various agricultural experimental fields. Wan Hsin-wei (1354 2404 3262) made charts from these reports by several years of Wu-hou records in our country. From these charts we can see that in the Soochow and Wu-hsi areas the start of the peach flower's blooming is from the last third of March. In the coastal Kiangsu area, the period starts from the first third of April. According to the records of 1937, 1948, and 1949, as collected by the writer, the prune flower in Hangchow is blooming before the "rain water" (one of 24 solar terms), and the peach and plum flowers are blooming before the vernal equinox. In Nanking it is about two or three days later. Liu Ting-hsien's native town was Ta-hsing and he stayed in Soochow for more than 20 years. He said that the Wu-hou of Soochow was comparable to that of Hangchow and Nanking. We can know that in the time of 1920's and 1930's the flower blooming time was earlier than that of Liu T'ing-hsien and Chuan Tsu-wang by ten days or one solar term (15 days). Also, it can be proved that in the 17th century, there was a cold period in the lower stream of the Yangtze River. From the cherry flower blooming time in Japan, we suppose that the 16th century was a cold period and in the 17th century it became warmer. This was possible because the first half of the 17th century was warmer, and the second half was colder. This was also the case in Europe. What

was narrated by T'an Ch'ien, Yeh Meng-chu and Liu T'ing-hsien was that of the second half of the 17th century. It is also possible that the climates of China and Japan were different then.

The above-stated is to base the present Wu-hou as the index to measure the Wu-hou and climate in ancient times. We can measure the climate in the beginning of the Manchu Dynasty, and we can also measure that of the T'ang, Sung, Mongol, and Ming Dynasties. Only if we have the reference of documents or any writings can we try to work along this way. The Wu-hou science had 2,000 years of history in our country. It was developed from the production practice with different results in different places and different times. For instance, more than 1,300 years ago, the indexes determined by Chia Ssu-hsieh are not possibly applicable in today's greatly developing agriculture, especially grain. We should greatly develop the trend of investigation and study on the target of high yield and based on the eight-character constitution in agriculture to determine new indexes of the various species of agricultural products. The Wu-hou observation didn't need too much labor or money. Only a small part of a garden or land was sufficient for the planting of the standard plants. This observational research can greatly help the "management" in the eight-character constitution of agriculture. After the defensive war of the USSR, a Wu-hou network was organized throughout the USSR as sponsored by the all-USSR Geographical Association. Until 1955 there were more than 500 observers to record Wu-hou of the various places in the USSR. Besides, under the instruction of the Ministry of Education of the USSR, there have been more than 1,500 Wu-hou stations organized in the secondary schools and the various areas. There has been development of investigation and study in our country. If a Wu-hou network can be organized, it will help in the forecasting of the agricultural seasons.

Lastly, I shall talk about the cause of the variations of the world's climate. In the time of geology, the cause of the climatic variations, especially the causes of the transition of the glacial period and the interglacial period, aroused great interest and many debates among the astronomers, geologists, and meteorologists. Some advocated that the North and South Poles of the earth could be shifted on time with glaciers in the areas nearing the poles. Some advocated that the continents could drift. When the continent drifts to the equator, it is warm, and when it drifts to the poles, it becomes cold. Some advocated that when the volcanoes have great explosions, the volcano ashes spread in the atmosphere as the cause of forming glaciers. Some advocated that the radiation variation of the sun is the cause of climatic variations in the world.

Though there is still no conclusion on these debates, still many scientists believe that the climatic variations in the world are directly related to the radiation strength of the sun. First, the world cycle of spring, summer, autumn, and winter, and the differences of the tropical, temperate, and cold belts are due to the radiation variation of the sun. In the past sun radiation was considered to be a constant and measured on this assumption. From the last years of the 19th century to the beginning years of the 20th century, the radiation constant of the sun had

very small variations in these years. This is 1.9 calories per minute per square centimeter on the earth's surface.

However, the number of sun spots, faculae, sun corona, etc. are revealing in the activities of the sun. These numbers have a variation cycle of 11 years. In the atmosphere, the magnetic storm, Aurora Borealis, and ionosphere are all related to the numbers. For more sun spots, the magnetic storm and Aurora Borealis are more disturbed in the ionosphere. In the 1920's it was discovered that the radio receiving is related to magnetic storms. So the astronomers and geophysicists began to pay attention to this problem. Not long after, they discovered that during the stronger activities of the sun, the ultra-violet rays and small radiation particles are greatly increased, and the magnetic storm and Aurora Borealis are produced from the activities of the small particle activities, and the disturbances of the ionosphere are mostly produced by the activities of ultra-violet rays. In recent years the exploring of the upper atmosphere by rockets has been stepped up and we are getting more and more knowledge of the relationship between the sun and the earth since the International Geophysical Year of 1957. When there are more sun spots, the ionosphere has disturbances, and the lower ozone layer absorbs great quantities of ultra-violet rays. So, in the high atmosphere the temperature of the stratosphere can be suddenly increased to affect the high altitude electric current of the atmosphere. The change of the high altitude electric current of the atmosphere can affect the distribution of the temperature and rainfall on the surface. Therefore, there are very complicated relationships between sun radiation and the climate on the earth's surface.

What is the effect of the 11 year cycle of sun radiation on the climatic variations on the earth's surface? From the reports of the various areas, the effects are not the same. According to the results of preliminary statistics, when there are more sun spots, there are more thunder, rain, hurricanes, and typhoons on the earth's surface, especially more rainfall on the equator. The big lakes near the African equator have a one-meter higher water level in the year of the maximum sun spots than the year of the minimum sun spots. There are wide annual growth rings on the big trees in the dry western United States. By cutting the big trees and inspecting its thickness of annual growth rings, we can see the cycle of 11 years. In the tropical and sub-cold belts, the temperature of the year with the maximum sun spots is higher than that with minimum sun spots. Since the 20th century, the year of the maximum sun spots was one of a severe winter in Peiping, such as the years of 1957, 1947, and 1917. The year of 1936 was the most severe winter in 60 years. That year there was only a difference of one year to 1937 with the maximum sun spots. However, in Shanghai and Hong Kong it was not coincidental concerning their winter temperatures in relation to sun spots. In the west, the discovery of the sun spots was after 1610 and the discovery of the telescope by Galileo. However, in our country the recording of sun spots was started as early as 43 B.C., the first year of Yung-kuang of Yuan-tyi of the Western Han Dynasty. Altogether there were 109 sun-spot recordings until the end of the Ming Dynasty in the years of Ch'ung-chen.

The recorded years in the various centuries with sun spots are distributed in the following Table 5.

Table 5. The Recorded Years in the Various Centuries with Sun Spots in the Historical Books of 24 Dynasties (Erh-shih-ssu-shih)

Century	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
The Years with Recorded Sun spots	2	1	20	2	10	0	0	8	2	3	17	7	9	0	1	5

We can see from Table 5 that the maximum recordings of sun spots appeared in the fourth century, the sixth century, the 12th century, and the 14th century. If compared with Table 2, the severe winters in the different centuries, excepting the lack of material in the fourth century, we have more recordings of the sun spots in the centuries which were also the centuries with the severest winters. The Institute of Geophysics and Meteorology of the Academia Sinica has researched the recent nine years in Peiping of the especially severe winter climate and especially warm climate. It was discovered that the processes are related to the high altitude electric current of the atmosphere. With the dominant west-east high altitude current in the atmosphere, especially warm weather will be more in the winter of Peiping. If the south-north high altitude electric current of the atmosphere is dominant, the especially cold weather is dominant. On the strong activities of the sun, the magnetic storm occurs in the earth to cause the occurrence of the obstructive high atmospheric pressure above the Eurasian Continent in forming a period of south-north high altitude electric current. If this relationship is always true, we can explain that in the year of more sun spots we have a severe winter in Peiping. However, Wei-liao-t'e of the United States obtained the reverse result from the weather materials in North America, and he considered that the east-west high altitude electric current would cause severe cold climate in the medium latitude areas and would be sufficient to form the glacial period.

However, the south-north high altitude electric current will create the inter-glacial period. This contradiction is because of an unclear explanation of the sun's effect on the earth's climate. It should be solved in some future time after deeper research. In short, though there are 150,000,000 kilometers between the sun and the earth, the sunlight still needs eight minutes to reach earth, and the small particles flow only needs one to three days. Since the utilization of rockets and artificial satellites for observation from high altitude, we know that the magnitude of the sun's ultra-violet rays and small-particle flows can vary, in a short time, to several or scores of times. Such variations are intimately related to our climatic variations. The research of the relationship between the sun and the earth is a recently-developed marginal science between astronomy and geophysics. Many new discoveries of astronomy can directly serve mankind such as the long-range weather forecasting and the explanation of the cyclic climatic variations.

In the past the climatic variations in the earth, including the

periods of history and geology, can be a footnote of billions of years' long life of sun in its development processes. Climatic variations, no matter whether the high or low temperatures or the quantities of rainfall, have greatly affected agricultural production. In the recent two years, the drought in northern China is an example. In the first third of October of this year, the International Geodetic Survey and Geophysics Association and the world weather organization will convene a conference in Rome to discuss the climatic variations in the world to pay more attention to the climatic variations in the period of history, i.e., the recent 2,000 to 3,000 years. Its motive is to utilize scientific methods discovered in recent years to seek a rule of climatic variations in preventing climatic calamities.

In short, the study of ancient climates not only has an intimate relationship with the progress of the creatures, the variations of earth strata, and the weathering of rocks and soil, but also has a similar intimate relationship with agriculture, forestry, and fishing production. It is a branch of science to which it is well worth our while to pay attention.

## COLLEGE NEWS

Following are translations of college news articles by Liu Wen-hsiang (0491 2429 4382) and Wang Wen-k'ai (3769 2429 2818) of the Correspondence Section of Kweichow University in Kuang-ming Jih-pao, Peiping, 29 April 1961, page 1.

### The Operations Research by Mathematics Department of Shangtung Normal College

The Mathematics Department of the Shangtung Normal College has vigorously developed the theoretical research work of the operations research. From the past accumulated materials, they have analyzed and researched in three theses of "The Operational Method of Delivering Telegrams," "Some Problems occurring in the Variable Functions," and "The Initial Discussion of the Steady Problems in Line Planning."

In the delivery of telegrams, the mathematics circle did research in the past with certain conclusions. In practice, there are often unsteady operations varying with time. This is the problem of variable functions. In the thesis of "some problems occurring in the variable functions," some new discussions and proofs have been introduced. In solving the practical problems, people often substitute the approximate values to the absolute values, because in the practical problems the coefficients are often the results of measuring, and we are unable to be absolutely exact. Hence, the wire length of the drawing operations and the cost of the chart operations are actually approximate values.

By taking line planning as an instance, small coefficient variations will cause the large differences of the "most economical value." Then the result of line planning by using the approximate values will possibly lose its significance in practice. Is there a certain stabilizing characteristic? In the thesis of "the initial discussion of the steady problems of line planning," by many analyses of practical examples it is acknowledged that there is a certain stabilizing characteristic in the ordinary chart operational method, drawing operational method, and maximum flow in the network by the practical application of the common line-planning problems. The operational personnel have benefitted with many conveniences and economizing of time by the solution of this problem.

### The Discussion of Literature Resonance in Kweichow University

Some teachers and students of the Chinese Literature Department of Kweichow University have recently discussed the problems of "whether there

is class characteristic in the poetry of mountains and rivers," and "the resonance phenomena in literature." In the discussion meeting, some comrades have submitted the following causes of resonance phenomena in literature:

(1) The readers are not of the same level and not every reader has an abundant knowledge of literature. Therefore, when they read writings, they do not completely understand the situations of the writers and the surroundings of the writing. Therefore, resonance is produced in these writings without strong class characteristics.

(2) The writers have to be in a definite objective reality in writing the articles. Many things revealed by the writings are often coincidental to the objective existence, but after long years people do not completely understand the subjective attempt of the writer.

(3) Although Stories of My Native Place by Ho Chih-chang, the Odes of Li Yu, and the poetry of Wang Wei embodied the sentiments and thoughts of the ruling class at that time, yet through the artistic and general patternization, a general popularity occurs in the individual article with one pattern significance. Hence, they are liked by the people.

(4) At the present time popular poetry and paintings of "mountains and rivers" have a generally high artistic value. So these articles are popular. Some comrades consider the artistic value of the literature to be not one of the conditions of resonance.

## II. ECONOMIC

### AN INTRODUCTION TO SAMUELSON'S ECONOMIC "THEORY"

Following is a translation of an article by Hung Yeh (馮葉),  
in Kuang-ming Jih-pao, 10 April 1961, page 4.7

According to news in the American magazine "Time", Samuelson has already been appointed as Kennedy's economic adviser. Before Kennedy's inauguration, he had already invited Samuelson to head a small group for the study of America's present economic crisis. The aim was to find a so-called policy for solving the crisis. The results of this study were published in January 6th of this year. The next day, the "New York Times" wrote in an editorial: The report of the group under Samuelson's leadership has for the first time furnished a pronouncement of the new government's viewpoint on this sort of problem." Looking at it this way, Samuelson, who is serving as Kennedy's economic adviser, should have a definite degree of influence on the Kennedy administration's economic policy.

Samuelson had become prominent rather recently in the bourgeois world of economics. He once studied at Harvard University and is presently a professor of economics at the American Massachussets Institute of Technology and is a leader in the American Society of Economics. He admits himself to "having been brought up on" the modern bourgeois economic theory of marginal utility. After Keynes' A General Theory of Employment Interest, & Money had been published he became a disciple of Keynesism. Among Samuelson's works the most representative of his economic thought is Economics which was published in 1948. This is a bourgeois economic text written to poison the thought of American youth and it continues to be unusually current right down to the present time, and is used widely in various American universities.

The principal contents of Samuelson's Economics consists of two economic theories: the modern bourgeois economic theory of marginal utility and Keynesism. The theory of marginal utility economic school enjoyed a conspicuous development during the decade of the seventies in the nineteenth century. From that time, this school gradually obtained an important position in the world of bourgeois economics in a good many countries. This tendency has been most conspicuous in England and America. The theory of marginal utility represented by Marshall has already become the orthodox thought of England's and America's bourgeois economics... The principal objective of those belonging to the school of

the theory of marginal utility is to oppose Marxist political economics. For example they substitute the subjective and idealistic theory of utility for the theory of labor value in an effort to conceal Capitalism's system of exploitation. According to the absurd theory of Marshall's group, capitalist society is one which can solve all sorts of contradictions through its own efforts and can not only provide the greatest satisfaction to consumers but will not suffer from serious unemployment problems. This sort of shameless misrepresentation praises the capitalist society as though it were eternal and ideal. The development of national monopolistic capitalism has resulted in the capitalist countries being subordinate to monopolistic organizations and in the latter increasing the use of State organs to intervene in the national economic life in order to guarantee their abnormally high profits and their ruling political position. Under these conditions, the capitalists naturally still welcome the praises which the traditional theory of marginal utility sings to Capitalism. But merely singing the praises of the capitalist system has not been able to completely satisfy the Capitalists's requirements in respect to economic theory. In addition to the banal praises sung to Capitalism, the monopolistic capitalists urgently require a set of economic theories to support them when they make use of the organs of the bourgeois state to manipulate policies governing economic activity. Then in 1936 was published Keynes' A General theory of Employment, Interest, and Money. In respect to the problem of unemployment, this volume of Keynesian Economics merely partially revises and supplements the traditional theory of marginal utility, and behind the facade of solving the unemployment problem it publicizes the policy of intervention by the State in economic activity. From this we may see that Samuelson's economic thinking is nothing but a synthesis of two pseudo-scientific theories which serve the interests of monopolistic capitalism.

In this Economics, Samuelson utilizes the two pseudo-scientific theories mentioned above to argue with all this strength in favor of monopolist capitalism. He describes monopolistic capitalism as being some sort of "mixed free enterprise system"; it is composed on one hand of the private "free enterprise system" praised by the school of the theory of marginal utility, and on the other hand of the concept of intervention by the State in economic activity as advocate by Keynesism. According to Samuelson's viewpoint, a policy of intervention by the State in economic activity can compensate for certain "defects" in the "free enterprise system". Thus capitalist society remains that ideal society for which the school of the theory of marginal utility propagandises. as a matter of fact, as everybody knows, the intervention by capitalist countries in economic activity is nothing but a tool for the enrichment of the monopolistic capitalists and it can only promote the exacerbation of capitalist contradictions and can by no means resolve these contradictions.

Pseudo-scientific theories are necessarily bankrupt in actual practice. Towards the end of last year, Samuelson had already publicly

admitted that the capitalist system has no way of avoiding economic crises. In spite of this he still makes out the same old Keynesian "prescription" which calls for and extension of government expenditures to deal with America's present economic crisis. In the report of the Samuelson group mentioned above, he advocates that in addition to expanding military and war preparations and to carrying out plans of aggression abroad, the United States Government should expand an additional 3 to 5 billion dollars. To use enormous government expenditures, to militarize the national economy can of course guarantee and increase exorbitant profits for the monopolistic capitalists. For example, on March 28, when Kennedy advocated an unprecedentedly huge military budget, arms industry stocks immediately shot up and steel and petroleum stocks which are related to the arms industry followed in the rise. But the militarization of the national economy must finally increase the contradictions between the productive forces and the requirements of the ability to pay and thus have the effect of increasing the contradictions in the capitalist economic crisis. For the past ten years the American Government has been using along with certain other methods the Keynesian one of expanding government expenditures, but time after time economic crises have forcefully demonstrated the bankruptcy of Keynesism. Samuelson could not but admit that since the second great war, America has passed through its fourth "recession". In addition, Government expenditures derived from its deficit budget must necessarily create inflation, lower labor's standard of living, and intensify contradiction between the classes. In the context of the current outflow of American gold, inflation is likely to result in still more financial and fiscal difficulties for America. To sum up, any policy or proposal which Samuelson may offer can only "move a rock over to crush one's own foot" and cannot solve capitalism's various contradictions, but on the contrary can only promote an intensification of the contradictions. His anti-crisis proposals furnish an excellent example of this.

## PROPER VIEW OF THE FUNCTION OF "FINANCE" IN THE ECONOMY

/Following is a translation of an article in Kuang-ming Jih-pao, 16 April 1961, page 1.7

A debate has been going on recently in the economic world concerning a financial question of substance. According to one view, finance consists of relations of distribution. The state utilizes currency as a mode for carrying out distribution of products. In back of the income of and disbursement of currency is the distribution of goods. This is not the general relationship of commodities and currency.

According to another opinion, finance is the utilization of currency by the State to regulate comprehensively the national economy; it is a currency relationship and not only a relationship of distribution. This is because currency relationships are not only the exchange of currency and commodities, but are the expression of economic relationships between people. If finance is looked upon as being only relationships of distribution, then we may neglect those features of socialist finance which takes production as its point of departure and this can lead to a separation /of our theory/ from production.

THE MASS WORKERS WELCOME LABOR DAY ON INCREASING  
PRODUCTION AND ECONOMIZING

[Following is a translation of an article in the economic column of Kuang-ming Jih-pao, 30 April 1961, page 3.]

The 1 May International Labor Day will arrive soon. The mass workers of the industrial departments have firmly developed their upward working spirit to vigorously plunge into the mass movement of increasing production and economizing to create more glorious labor merits in receiving this great festival.

Producing More Good Coal and Economizing Coal Usage

In providing more fuel for the industrial and transportation departments, and more raw materials for some chemical products, the workers of the various coal mines have exerted their greatest efforts in increasing coal production. The thorough inspection and overhaul of the coal mine equipment all over the country since January have obtained great results. In the 61 key coal mines, the large stationary equipment has been fundamentally completed in inspection and overhauling. In the first line of production, the combines, undercutting machines, electric loading machines, and coal freight cars have been greatly improved in their utilization situation. The workers of the various mines have sufficiently utilized these advantageous conditions to increase the output. The Hao-pi Coal Mine of Honan Province has increased the coal output more than 20% than before the equipment inspection and overhaul. The increase is because of the promotion of operation techniques and sufficient exploitation of the equipment efficiency. The Lung-men Mine of the same province still relies on old miners in smoothing the administration system to transform 90% of the tunnel into excellent condition with increases of 30% to 40% in digging and mining efficiency as compared with that at the end of last year. Since February, the coal output has been increased every ten days.

The small coal mines are important in coal production. In the processes of increasing coal production, the small mines have sufficiently exploited their potential. In the provinces of Shantung, Szechuan, etc., the small coal mines have been technically reformed on a whole scale. About 85% of the small mine shafts in Shantung Province have been mechanized and semi-mechanized. In Szechuan, 20 small mine shafts have more than doubled their daily output through the reform. In the first quarter of this year, these mines increased the production by 30,000 tons of raw coal for

the State.

At the same time of vigorously increasing coal output, the various places have further vigorously developed the coal economizing. The economizing of coal usage is an important measure in solving the insufficiency of fuel at present. According to computation, by saving one ton of coal, 1,600 kw/hr of electricity can be generated, or 12 tons of steel rolled, or 82 bolts of blue cloth dyed, or the fuel for the whole year for a five-member rural family supplied. At present, in the northern provinces the mass movement of economizing the coal usage has been developed. Tsitsihar Paper Mill has decreased the consumption of coal for each ton of paper manufactured by 37% compared to last December. From the beginning of this year up to now, more than 3,000 tons of coal have been economized. In Anhwei Province, every worker of the Peng-pu Steel Mill economizes the coal. Within a three month's period, they saved more than 34,600 tons of coking coal and more than 12,300 tons of coke to provide better conditions for the increased production of steel.

#### Increase the Steel Production and Roll More Steel

The mass workers of the steel front line have engaged their creative labor to produce more and better steel. First of all, there should be needed the sufficient and high-content iron ores. Many metallurgy enterprises consider the iron mining as the first priority. The Ma-an-shan Steel and Iron Corporation of Anhwei Province has removed the bottlenecks of the ore processing, crushing, and in-mine transportation to speedup the technical mine reform. At the same time, 11 small iron mines and three small secondary material mines in the whole province have been reformed on power, shaft, and tunnel engineering to raise productivity. In insuring the quality of the ore, the Ma-an-shan Steel and Iron Corporation has established and solidified the inspection system of raw materials to keep bad ore from leaving the raw material working sites, and from entering the blast furnace and open hearth furnace. It has obtained good results.

The incessant development of the ore production has provided better conditions to the increased production of steel and iron. The workers of the iron making of the First Steel and Iron Mill of the Pen-ch'i Steel and Iron Corporation have developed a cooperation campaign of excellent quality, high production, and low consumption to promote and steadily increase the various items of production. In March the output of cast iron overfulfilled the plan by 7.8%. The acceptable rate of cast iron has been raised by 1.97%, the quality has risen 2%, and the coke consumption has decreased. The steel-making shop of this mill has achieved good results of excellent quality, high production, and low consumption. For a raising of quality and an increase in varieties, the steel-making shop of the Ch'i-shu-yen Locomotive and Freight Car Plant has made 213 furnaces of steel since March without any failures, and the steel varieties were increased to 11 from three in the fourth quarter of last year. Moreover, there also has been made the high-class alloy steel including chromium-silicon steel and manganese steel.

The increase of steel production of the better quality can further satisfy the demands of the various sides. The workers of the tilted furnace shop, steel rolling shops, transportation, supply, and technical departments of Chungking Steel and Iron Corporation have developed a "co-operation emulation campaign in successful manufacturing of 100 furnaces of steel." In the first ten days of April the successful manufacturing rate of the tilted furnace steel in the whole corporation had an increase of 18% over the last ten days of March.

#### Vigorously Produce Chemicals Including Acids and Alkalies

In the chemical industry, the most important of all is the vigorous increase of the production of alkalies and acids, especially the increased production of sulfuric acid, caustic soda, and soda ash. Many products in the chemical industry need acids and alkalies as their fundamental raw materials. At the same time, other industries such as metallurgy, light industry, and daily necessities need greater quantities of acids and alkalies. In increasing the production of acids and alkalies, the various chemical enterprises have paid attention to sufficiently utilizing the chemical raw materials. The Ta-t'ung Electrical Chemical Factory in Hang-chow has adopted the workers' proposal to promote the work operation method at a decrease of salt consumption month after month since the beginning of this year. According to the computation of this factory, if the salt consumption rate can approach that of the advanced factories, 20% or more of the caustic soda can be increased in production without the increase of the raw materials. They are struggling along this direction. Owing to high corrosive reaction by the acids and alkalies to the equipment, the timely inspecting and repairing of the equipment is important to the increased production of the caustic soda.

The Tientsin Chemical Plant, which is the largest producer of caustic soda in our country, has sufficiently initiated the masses since the first quarter of this year to speed up the equipment inspection and repair to effectively restore and raise the equipment capacity. Moreover, the plant has strengthened the production organization to push up the caustic soda output month by month. The State production plan of the first quarter was overfulfilled by 24%, and the average daily output in the first ten days of April had an increase of 18.1% compared to March, with quality surpassing the State plan, and the consumption of the principal raw materials, raw salt, and electricity being lowered month by month.

In raising the production of sulfuric acid, Kwangtung Province has vigorously adopted the measures of equipment expansion and distribution to respectively transform the 120 sets of small contact process sulfuric acid manufacturing equipment with each set at an annual capacity of 400 tons. This equipment has been transformed from domestic-method to foreign-method production. A set of equipment of Kao-chou Chemical Plant in the Shen-chiang Special District was transformed and plunged into production with the daily output raised from one ton to more than two tons.

Kirin City engaged in the thorough regulating and advancing of the

small chemical enterprises to combine the 496 small chemical enterprises into two chemical corporations, six united chemical plants, and 80 chemical main factories to exclusively produce more than 350 products. Through regulating, solidifying, and advancing, the basic chemical raw materials have been increased, and production of sulfuric acid, nitric acid, hydrochloric acid, soda ash, caustic soda, calcium carbide, and alcohol has also increased to serve agriculture and the people's living needs toward a new development.

#### Expand the Sources of Raw Materials and Increase the Production of Light Industry

The workers of the light industry and handicraft industry have expanded, by all means, the sources of raw materials to promote the operation technique and increase the production, especially concerning the seasonal merchandise to meet the masses' daily necessities. For producing more and better summer daily necessities, the workers in light industry and the handicraft industry have initiated a labor emulation campaign to utilize the waste materials in the warehouses to economize and use substitutes in solving the problems of insufficient raw materials with an impressive production result. Up to now, more than 300 kinds of summer goods have been produced, including slippers, bamboo beds, T-shirts, vests, bath towels, straw hats, and wooden bath tubs, with most increasing more than 40% over last year. Some of the merchandise has already been supplied to the market. In the processes of light industry production, they have paid attention simultaneously to more quantity, better quality, and more varieties of the product. According to the statistics of the related departments of Tsinghai Province, more than 200 light industry products have been increased this year to bring the total varieties up to more than 3,000. The quality of these products have different degrees of progress, with new developments for well-known products and art goods. Our well-known Sian People's Enamel Factory has increased the proportion of artistic enamel from 20% in last year to over 90%. The well-known Chang-hsiao-ch'u'an Scissors Factory has increased product varieties from less than ten in last year to 36.

At the same time of vigorously increasing production and exploiting the material potentials of the light industries, the various places have further developed repair services. In Shanghai more than 8,000 service stations with more than 26,700 service personnel have been established to form a big repair network of many items and varieties to sufficiently exploit the material potentials in facilitating the masses.

#### Extensively Investigate, Improve Management, and Advance Techniques

When the various industries engage in the production with greater, faster, better, and more economical results, investigation and study have been universally stressed for technical innovations and improvement of management in incessantly transforming the industries to a new appearance

of production and technique. The industrial workers in Heilungkiang have continuously developed the technical innovations and revolution movement since this year in creating a new high tide in a part of the enterprises. This movement is concentrated on the advance of quality, increase of varieties, and the decrease of cost with successful results. Through investigation and study, many enterprises in Harbin have classified, concluded, assembled, and expanded many new techniques and experiences which appeared last year. In the machinery, metallurgy, chemical, and textile trades in Harbin, there have been assembled and expanded more than 5,600 items of innovations since this year to greatly advance the product quantity and quality, and to decrease raw material consumption. Since the expanding of the experiences of rationally using electricity, the Harbin Car Plant has saved 600,000 kw/hr of electricity in the whole year. At the same time, some enterprises have made new creations and inventions of scores of new products in successful trial manufacture this year in Harbin.

In stressing the enterprise administrative work, the leading cadres of many enterprises have extensively applied the investigation and study to the production practice in realizing the situation to thoroughly regulate the rules and system in concretely solving the production problems for a better production procedure as established by enterprises for vigorous production. The various levels of the Party Committees of the Hsi-shan Mine Bureau of Taiyuan have constantly applied the method of convening investigation meetings and visiting workers to study the important production problems in seeking the sources of difficulties and ways of solution to greatly improve the enterprise administrative work.

Every work level is the responsibility of certain personnel with clear-cut duties and rational awards to greatly promote the administrative work of enterprises in pushing the steady increase of coal output. In the first quarter of this year, the mining and digging plan was overfulfilled. From the analyses of waste products in improving the rules and system to carry out strictly, the First Open Hearth Shop of the Chungking Steel and Iron Corporation has increased the steel production and quality impressively. In March the acceptable rate of steel was 100%. Among them, there were 70% of excellent steel and Class A steel with less than 2% of the Class C steel. By now this production merit is being solidified for the continuous advance.

## THE DIFFERENCE AND UNIFICATION AMONG INVESTIGATION, STUDY, AND STATISTICS

[Following is a translation of an article by Yang Tseng-wu (2799 2582 2976) In Kuang-ming Jih-pao, Peiping, 1 May 1961, page 4.]

Since 1958, under the glorious brilliance of the three Red banners, statistics of our country has been thoroughly reformed. In the three years there has been a new atmosphere for practical statistical work and its research. Especially since the development of the learning in 1960 of Comrade Mao Tse-tung's writings by all the people, we have had a clearer concept that statistical work has to go along the fundamental direction of Comrade Mao's thoughts of investigation and study. We all acknowledge that statistics should be investigated and studied, that statistical organizations are the Party's organizations for investigation and study, and that statistical ideology has to be based on these writings with investigation and study as the principal contents. The Party and government have requested that in every department and every job, investigation and study be fully developed to reform the leadership attitudes in thoroughly executing the Party's policy and direction. Under this situation, the importance of the investigation and study have been deeply rooted in the people's hearts, and the duty of statistical personnel is more important than ever.

At the same time of emphasizing the investigation and study of statistical work and ideology, there has been a problem, i.e., the relationship between statistics on the one hand, and investigation and study on the other. Generally speaking, statistics are investigation and study. However, not all investigation and study are statistics. There is an intimate relationship between statistics on the one hand, and investigation and study on the other. However, they are not identical. What is the relationship between the two? What is the unification and difference between the two? How should we correctly deal with the investigation and study of statistical practices and its ideology research? In my opinion, the clarification of these problems will help in the development of statistical work in our country.

Strictly speaking, all statistical work is the work of investigation and study. It not only includes the pattern investigation, key point investigation, and general inspection by specialized organizations, but also includes the whole-scale statistics with the form of reports and charts. Either whole-scale statistics or specialized investigation is a form or method in understanding situations. Ordinarily, what we call statistical

investigation and study has a smaller scope. It only includes the on-the-spot investigation and study, excluding all other forms of collecting materials as reports and charts. In the following, what I call statistics denotes that kind of investigation and study as stated above.

Ordinarily speaking, the scope of investigation and study is very broad. It is the necessary process for the Marxists to examine problems, study problems, and solve problems. Concretely speaking, all who base on the standing, viewpoint, and method of Marxism-Leninism in concretely and deeply inspecting the development and transformation of the objective things by starting from practice and contacting the masses. The analyses and studies of the accrued materials in correctly judging situations, and in clarifying the character and trend of things, can be relied on to decide policy and instruction of actions. All these are investigation and study, which include the inspection by the leaders of the Party and the Nation, the investigation work of the various levels of statistical departments and operation departments, the scientific research work of the institutes, and all the investigation activities of daily work, learning, and living as conducted by the masses. The extensive scope not only includes the various sides of social living, but also includes the investigation, experiments, analyses, and research activities of natural science. In short, the activities of investigation and study are very extensive in scope. It is the way to arrange work, and it is the tool of production, living, work, and learning by the masses. It is really the weapon of the masses, and the unreplaceable treasure in doing revolutionary work well at the practical attitude of every dialectic materialist on a preletariat world view.

Concerning statistical problems, we know that statistics is a tool, a way, and a weapon. It is fundamentally identical with the characteristics of investigation and study. In the ideology and practical activities of investigation and study, Comrade Mao has pointed out the reform direction of statistics. In the reform of statistical operations, the statistical personnel also have reformed their thought method and work attitudes from mainly relying on reports and charts to on-the-spot investigation and study among the masses. This is the most effective route in overcoming the bureaucracy in statistics. Comrade Mao's thoughts on investigation and study have pointed out the direction in exploiting the functions of statistics, and at the same time his thoughts also have exploited the fields of broad learning and study to lead to a new step in the development of statistical science. Moreover, the practice of statistical reform also has made Comrade Mao's thoughts on investigation and study develop further to let the thousands and millions of people who are holding this weapon better serve the socialist revolution and construction with a clear mind.

Statistics is a powerful aid and tool to engage in investigation and study of the leading organizations of the Party and government. However, it is not the only weapon. As with statistics in the social sciences, it only investigates and studies the social living without concerning the natural side, and also doesn't include the investigation activities of the individual work and living. It then has a much smaller scope than general

investigation and study. On its characteristics, statistics is a special form of investigation and study and it is different from the general investigation and study mainly in the three following aspects:

1. In the method of investigation, statistical investigation and study further emphasize the combination of spot and area. This is because the characteristics of statistics are to deeply penetrate the key points of the whole area and to combine the concrete materials of the pattern investigation to the general materials of the general investigation. Thus, the unification can be formed through debate and proof between special and general contradictions. This does not mean that the statistical departments cannot make special topic investigations. Actually, based on the demands of the leadership of the Party and government, for the solving of some specialized problems various specialized investigations and studies have to be made. However, it does not affect the combination of the characteristics of the pattern and the general investigation.

2. In the content of the investigation, statistical investigation and study emphasize the understanding of the quantity situation relating to the investigation and study of the situation and problems on the quantity side of the Party's policy. For instance, in stressing the first-line labor force of agricultural production, the Party's Central Committee has regulated that no less than 80% of the rural labor force should be used for grain planting, and no more than 20% of the labor force can be used for forestry, ranching, secondary foodstuffs, fisheries, industries, culture, and education. The statistical personnel should investigate and study the actual labor force proportion in rural villages between production and non-production to find out the actual execution situation in submitting problems and proposals as reference of the Party leadership. This does not mean that every statistical investigation has to be centered on quantity. We have seen many good statistical reports with more situation information and less figures; however, as a characteristic of statistical investigation and study, the quantity content is necessary.

3. In organizing the work, statistical investigation and study further requires the strict following of scientific methods and steps of statistical work, and strict procedure under the unified organization leadership. From the regulating of the plan starting from outlines to engage in investigation and study as helped by the organizations, to arrange the materials, for analysis and study in finding out the problems to make proposals -- in the whole process, the statistical methods of the various sciences have to be used.

There is a difference between statistical investigation and study to that conducted by the leadership. Statistical investigation and study provides information and materials for leadership, which badly needs these materials, together with those collected by general statistics. However, to sufficiently utilize these materials, the leadership should independently conduct some pattern investigations. As said in the editorial of Hung-ch'i magazine, "The correct and exact statistical figures are very important in grasping the whole situation. However, only those leaders who thoroughly understand the actual situations can then utilize these figures for

general conclusions. This is the basic reason of Comrade Mao's strong emphasis that the leadership should independently conduct the pattern investigation and analyze by himself several 'sparrows.' And this is also the basic reason of his repeated instructions to the people not to rely completely on the written reports and statistical charts by only reading these materials." (Editorial, Hung-ch'i, Nos. 3 and 4, 1961.)

We can see from the above that statistical investigation and study on the investigated problems are only the preliminary and general materials.

Though the conclusions should be definite, they cannot displace the on-the-spot investigation and study by leadership itself. Though a good statistical investigation and study can somewhat decrease the investigation and study as conducted by the leadership itself, it cannot include all investigation materials needed by leadership.

Concerning the attitudes in engaging in investigation and study, our statistical workers have to pay attention to preventing two deviations. The first deviation is the "all included" attitude. We can see that this deviation often appears in the research work of statistical ideology. It is to consider all investigation and study as statistics. Every time we hear the terms investigation and study; they are considered to be statistics, statistical work, or the problems to be studied by statistical ideology. This is to mix up investigation and study into statistics in expanding its function. The concrete manifestation of the research of statistical ideology is to consider the ideology of investigation and study as the ideology of statistics, and not to combine Comrade Mao's thought on investigation and study to statistical operations of combining the characteristics of statistical investigation and study in creatively writing a series of all-new socialist statistical ideology. They write great quantities simply on the ideology of investigation and study and misunderstand it as statistical ideology. Actually, they misleadingly substitute the ideology of investigation and study for that of statistics.

The other deviation is an "all excluded attitude. It is just the opposite of the first deviation. The deviation is to separate the statistics on the one side, and the investigation and study on the other side. They over-emphasize that it has to be completely the statistics and neglect the pattern investigation. This deviation occurs easily in the operational departments especially since the including of all the whole-scale statistics in the statistical departments. Somebody considers that the operational departments can concentrate on investigation and study, and the statistical departments have to concentrate on the whole-scale investigation without the strength to practically contact the masses for investigation and study. This is not a thought at whole scale, because if the statistical personnel do not practically engage in investigation and study, then they will make out the figures behind closed doors separated from the practice. Thus, the reform of statistics still cannot exert its due function.

In dealing with the problems of investigation and study, statistical personnel should have a correct attitude. First of all, they have to sufficiently understand the significant instruction on statistics by Comrade Mao in his thoughts of investigation and study. They have to

thoroughly learn Chairman Mao's related writings and the Party's related instructions in grasping its real essence. Second, they have to clarify the unification and differences between investigation and study on the one side, and statistics on the other side. They especially have to correctly realize the relationship between the thoughts of investigation and study and statistical operations.

Third, they have to properly combine Comrade Mao's thoughts on investigation and study to the statistical operations, and to properly combine Mao Tse-tung's thoughts with the abundant practices of statistical work in our country in creating a series of all-new and unified scientific socialist statistics with the particular Party character.

### III. SOCIOLOGICAL

#### ADEQUATE PROTECTION AND CONTROL OF WORKS OF CULTURE PROCLAIMED

Following is the translation of an editorial in Kuang-ming Jih-pao, Peiping, 2 April 1961, page 1.<sup>7</sup>

The Ministry of National Affairs today announced the "Temporary Regulations Governing Protection and Control of Works of Culture," with a list of names of the first batch of organizational units in the entire country charged with the duties of protecting works of culture, and a directive for concerned personnel to follow.

These regulations have been set up, based on experiences gained during the past 11 years in the maintenance administration relating to works of culture, and in conformity with the practical conditions of the economic and productive construction of the country. They will serve, therefore, as a sound basis for reference in the administration of activities pertaining to protection and control of works of culture in the future. If conscientiously and effectively carried out, these regulations will serve a great useful purpose both in our effort to preserve the cultural heritage that our forbears have bequeathed to us, and of helping to glorify the excellent traditions of our nation.

Our country has a long history and a glorious cultural background. Abundant quantities of works of culture with both historical and revolutionary significance still remain above and beneath the ground. These are important vestiges of our historical culture; they are the crystallization of the intelligence, ingenuity, and industriousness of our ancestors; they reflect the various aspects of the social products and social life of the different eras of our national history, especially with regard to works of culture related to revolutions of modern times. These last mentioned are the most accurate and realistic records of the heroic revolutionary struggles of the Chinese people under the leadership of the Chinese Communist Party in the past 40 years. Work well done in the protection and control of works of culture will have an important bearing on the development of scientific research and socialistic cultural construction of our country.

During the past 100 years the habitual robbers -- the imperialists in collaboration with the reactionary governments and crafty merchants -- have smuggled large quantities of precious works of culture out of the country, incurring heavy losses to our cultural heritage. Since the establishment of the People's Republic, the Chinese Communist Party and the government of the People's Republic have regarded the protection and control of works of culture as a serious responsibility. A series of laws

and directives have been proclaimed, putting an end to robbery and theft of, and damage to, works of our national culture, and setting up a strong foundation for the protection and control of these valuable historic treasures. As the initial step, the proclamation lists the preservation of important historic sites since the time of primitive society; ancient tombs; ancient construction works from the Han and T'ang Dynasties; works of engraving, carving, and sculpture; art works from rock caves; sites of typical revolutionary activities from the time of the Opium War to the establishment of the People's Republic; and to make any necessary restoration and repair.

Next in order is archaeological excavation on a large scale to recover large quantities of works of culture that are still buried under the ground. All this work is to be done in coordination with the economic construction program. The purpose of furnishing abundant materials for historical research is to fill the blank pages of the history of our country relating to periods before our language was invented. In addition, necessary steps will be taken to acquire private collections of works of culture, including those that are of the general nature, and those that have revolutionary significance. Such collections will be of great importance in enriching the exhibits of museums and for scientific research. Only under the leadership of the Communist Party and in an epoch of socialism can the historical heritage of our country be protected and glorified.

The activities in connection with the protection and control of works of culture have a direct and close relation with the other basic construction activities. This is because they are different in nature from the other cultural activities. To carry out the program of the protection and control of works of culture in coordination with the construction works program is a common responsibility of the Division of Construction and the Division of Culture. The division in charge of protection and control of works of culture is an organized agency of the government. It belongs to the higher level, but it must serve for the development of economic construction. It is undesirable to overemphasize the activities of the protection and control of works of culture, causing an adverse affect on the construction work. It is equally undesirable to emphasize construction work and neglect activities in connection with the protection and control of works of culture. We must give consideration to the long-lasting and far-reaching advantages of revolution, as well as our immediate needs. We must coordinate and deal with the two properly. This is necessary because some of the important works of culture are not only precious cultural heritages of our country, but also are valuable treasures reflecting the progress and civilization of the human race. We must be resolute in our effort to protect them.

The proclamation has explicitly set forth some fundamental principles of action regarding the protection and control of works of culture which will enable the various agencies administering cultural affairs to cooperate closely with the agencies in charge of construction. In case any question relating to the protection and control of culture works arises

in any construction work, the agencies concerned can analyze the question, match the concrete existing conditions with the proclaimed fundamental principles, then proceed to adopt definite ways and means that are beneficial to both productive construction and to the protection and control of works of culture to assure strict enforcement of the "Temporary Regulations Governing the Protection and Control of Works of Culture."

All activities relating to the protection and control of works of culture should be adapted to the construction development programs of municipalities. All units of historical sites related to either revolution or culture, and ancient structures, should be included in such programs. In the last few years the People's Committees at different levels throughout the country not only have done much individually in relation to the protection and control of cultural works, but also have organized over 8,000 agencies to exercise the function collectively. The 180 units named in the proclamation of the Ministry of National Affairs have been selected from the list proclaimed by the various municipalities throughout the country. All the works of culture in these protectorate units have great historical, artistic, and scientific value. They all are concrete evidences for specialized studies of histories of revolution, social development, arts, and construction.

New cities are rising throughout the country; old cities are continuously being remodelled and expanded. In the processes of building new cities and remodelling old cities, there must be selection and emphasis in the preservation of these important historical sites of revolution, historical sites of culture, and ancient construction. By this means we not only objectively extend traditional revolutionary education, historical materialistic education, and patriotic education to the great masses of people, but also enable the various cities to preserve their respective historical and national differences as reflected in the style and appearance of their construction works. This will add richness and beauty to our new socialistic cities. The proclaimed regulations specify that they should be incorporated into all plans of construction, making them a realistic and organized part of the unity of each modern city. This specification is obviously necessary.

The work pertaining to the protection of works of culture is a branch of scientific research. The ground covered by works of culture is unusually broad. To do the work well in connection with the protection and control of cultural works, social science and natural science are involved. Many problems that are artistic, scientific, or technical in nature cannot be solved by the department or division in charge of the protection and control of works of culture. On the other hand, the fruit that will be borne by the activities of the protection and control of cultural works will be abundant materials for scientific research. On this account, it is unusually important that agencies in charge of protection and control of works of culture and agencies concerned with scientific research should have close cooperation. At the same time, the success that the activities relating to the protection and control of works of culture have achieved on the one hand, and the enthusiastic response of the great masses in sus-

taining these activities on the other hand are indispensable and inseparable. It happens that not only do some people voluntarily donate their private precious collections of works of culture to the government, but also that some others report the discovery of any such works. The great masses of workers and peasants throughout the land very often voluntarily protect some important works of culture, taking action in time to preserve them. There are many such instances which we can cite. All this quite sufficiently proves that the great masses enthusiastically love the historic culture of our Fatherland.

In conclusion, it should be pointed out that in order to further the activities pertaining to the protection and control of works of culture, we must depend upon the leadership of the Party, must be politically minded, travel the road of the masses, cooperate closely with agencies in charge of basic construction and agencies concerned with scientific research, and seriously carry out the "Temporary Regulations Governing the Protection and Control of Works of Culture." We are opposed to any negative attitude taken toward activities relating to protection and control of cultural works, but we are also opposed to any tendency of "protecting anything that is ancient" and "protecting for the sake of protection." In this way we can make the activities relating to the protection and control of cultural works contribute toward creating a new culture that is both socialistic and nationalistic in the process of our critical acceptance of the excellent heritage of the historical culture of our country.

## SOME SUGGESTIONS CONCERNING ARCHITECTURAL ART

[Following is the translation of an article by Ch'en Po-chai (7115 0130 7872), Chairman of the Architecture Section of the Hua-nan Workers' Institute, in Kuang-ming Jih-pao, Peiping, 4 April 1961, page 2.]

Roughly speaking, construction is house building. There are many things that people require of a house. These requirements may be summarized and classified into three categories: usefulness, economy, and beauty. The order of importance of these requirements should be, as the Party has dialectically and accurately pointed out, usefulness, economy, and beauty within the bounds of feasibility. This policy of the Party with respect to construction is entirely sound.

We build houses because they are useful to us with reference to living. It is plain that the primary requirement of a house is usefulness. It follows that a house should meet the requirements of usefulness in as many respects as possible. From this point of view, usefulness is the most important of the three requirements mentioned above. It is the first requirement to be considered in a construction project, and must be satisfactorily carried out.

The building of a house requires large quantities of materials and much labor. This means that a certain amount of money has to be invested. The general principle is, subject to meeting the requirements of usefulness, economize as much as possible on materials and labor so that money can be saved for building more houses. Or, using the same amount of money, plan in such a way as to make the house more useful and better built. This is also very important.

As regards beauty, under the conditions of first meeting the requirements of usefulness and economy, houses should be built with some artistic value. They should be attractive; they should have some aesthetic quality for appreciation. This beauty quality must not be overlooked in the building of a house. It is not something that is unimportant, although its importance is secondary.

As a matter of fact, nothing has been manufactured for use without beauty as one of its attributes in the mind of the designer. Take, for instance, articles we use every day such as pencil sharpeners, wares for food and drink. They are made in different shapes, forms, and designs to appeal to the different aesthetic "tastes" of different people. The books we read have been planned to look attractive with reference to their format and binding. But all just mentioned are only conditions to meet the

secondary requirement. The most important requirement is still usefulness. It is inconceivable that a person would buy a book solely for its beautiful binding. A building is comparatively a massive structure, and will stand up for a long time, once completed. People passing by would naturally like to see its beauty reflected in its style and finish, which in combination with its usefulness presents a pleasant atmosphere for living. Such a combination is very important.

Since construction, or more accurately, architecture, has to meet the requirement of aesthetics, its dealing with the problem of beauty is in the realm of art. So architecture has an art aspect. This point should not be overlooked. But architecture is, after all, different from other arts such as painting and sculpture. When architecture dissociates itself from usefulness and economy, it ceases to have any practical significance. If we overemphasize the art aspect of architecture, or even regard architecture as purely art per se, we can commit no blunder more absurd and egregious.

Some people are in the habit of associating the subject with some few special structures in the world, either of the past or the present, when architecture is mentioned in a conversation. Of course, some few special works of construction are worth discussing. But we should talk more about the large number of works of construction, such as houses, schools, hospitals, large buildings, etc., with reference to their appropriate artistic value. If we confine our discussion to these kinds of constructions, the task is easier and more definite, because they represent more types and less special technicality.

When we speak of "usefulness" of an architectural structure, we refer to the practical purpose or purposes it serves. A building is the end product of a process that involves the use of certain materials to make a structure of a certain form, basing on certain fundamental principles. Fundamentally, it must meet the requirement of "usefulness," or, in other words, it must serve certain practical purposes. But it must also, under feasible conditions, meet the requirement of beauty by virtue of its style. A house and a school, on account of the different purposes they respectively serve, assume different forms and styles, and can therefore be easily distinguished one from the other, for the form or style of a building reflects its internal structure, the materials with which it is built, and the purpose or purposes it serves. Two schools, one built with a wooden frame, bricks, and tiles, and the other of steel frame and concrete, look different from the outside. This is to day, on account of the differences in the materials used and the kinds of framework adopted, the two buildings would appear different in shape or form. There are many cases which we can cite to bring home our point. Take the dining hall of this institution. Its roof is built with hollow bricks laid on the framework. It looks quite different from one built with tiles laid on a wooden structure. The former has the appearance of a tomb. We would not build a house with that kind of roof. But we can modify the tomb-like roof by adding something to it to make it more appealing. This naturally increases the total cost of the construction, for more materials and labor have to be used in the

modification. Besides, the roof is still a dome-shaped structure. Such a process is not in conformity with the principle of "usefulness, economy, and beauty within the bounds of feasibility."

Construction with emphasis on form is architectural formalism. The form of a building is a reflection of the structural composition of the building. It is also a reflection of its usefulness. The usefulness of a building should be emphasized. But we must not mistake emphasis on usefulness for utilitarianism. We are opposed to utilitarianism. The two are not the same thing. So we should not be afraid to emphasize usefulness in connection with construction. One more word in regard to form. The material composition is one of the factors that determines the form of an architectural structure, but it is not the only factor.

When we speak of new material, we mean that the material is recent. The implication of anything being new or recent is that it is supposedly better than materials that are old. Its quality is supposed to be better, its cost lower, etc. Utilizing the good quality of new materials to the fullest extent would enable us to come up with some new forms in our architectural construction. On account of new developments in science and technology, we can now build houses with less materials and in simpler processes. With reference to materials and structures, new ones are more useful, more economical, and more beautiful than old ones. If there is a case that does not prove this point, the things used that are supposed to be new are not really new. If the quality of new materials is fully developed, houses built with such materials would have new factors with reference to form. Material is one of the factors that determines the form of a building. Other factors being constant, the form of a building is influenced by the materials used.

Architectural structures have class characteristics, or styles. They reflect the system and the standard of the culture of society. But to look for such reflections solely in the exterior of a building, namely, its shape, or form, or color, is impossible. It is possible only in the case of painting and sculpture. The things that constitute the exterior of a building are the walls, pillars, corridors, doors, windows, railings, door sills, eaves, and the size and form of the body unit. One can create an atmosphere of dignity, serenity, cosiness, simplicity, and the like. It is impossible to expect too much from this approach. To try to add something sublime, high-sounding, or mystified to architectural art is not only impractical, but hinders its rapid development.

Since the establishment of communes, many problems have been posed for the architects, such as collectivized living, socialized housework, small free units within a large unit, etc. As to how these can be provided requires imagination. From the time a plan is conceived to the time when all details are embodied in the blueprints, usefulness should be constantly kept in mind, and it should be made manifest in the final organization. Then, and only then, can the glory of the red flag find reflection.

Some of the things that the architect of today must give attention to are the arrangement of units of living accommodations, dining rooms,

social centers, day nurseries, kindergartens, recreation centers for adults, playgrounds for children, etc. Houses should be aesthetically arranged, and must be provided with a background of beautiful landscape. When people live in such atmospheres of comfort, they can't help realizing that the Party is concerned with them to the most minute details. Socialism will then stand on solid ground. The things we suggest here are impossible in capitalistic countries. There one can only see the contrast between the magnificent villas of the big shots, the fleecing class, on the one hand, and the slums of the poor working people, the fleeced class, on the other. In the capitalistic countries the things that are uppermost in their hearts are greater production and more profit for the capitalists, who are indifferent to the welfare of the working people -- their physical and mental well-being. There are differences between the two systems, even in one respect -- the construction of a factory. Since the composition is reflected in the form of a building, we must utilize the principle of aesthetics to make the form meet the requirement of beauty. When people see such beautiful forms they associate the external form with the internal composition. Such is genuine appreciation. In this way the class characteristics and ideological characteristics manifest themselves fully. Such is mannerism in architectural art in socialistic countries.

Our country has a long history of culture and excellent traditions of architectural construction. But we must not inherit these traditions with respect to form alone. Our habits of living, our modes of activities, our climatic conditions, and our natural environment are quite different from those of other countries. We have our own taste, likes and dislikes for certain materials and for certain uses and applications of these materials and their compositions. What is suitable for Western people is not necessarily suitable for us. It is impractical to use imported things. Possessing the same usefulness, anything that is suitable to our habit of living, any form that is reflected by our modes of activities and our climatic conditions would not be suitable to the Western people. Any shape, form, figure, or color that appeals to us Chinese and are regarded by us as something close to our hearts are Chinese.

Therefore, to create new Chinese and socialistic mannerisms is by means of collective creation. We should extensively solicit the opinions of the great masses of people, regard the masses as our teachers, learn from them, and travel their route. Any work of construction that is considered by the masses as beautiful and good necessarily must meet the requirements of usefulness, economy, and beauty. Consider the beauty aspect alone. If it lacked our rich national characteristics and excellent traditions, the masses' reaction to it would not be one without criticism.

## TEACHING AS CENTER OF ALL SCHOOL ACTIVITIES

[Following is the translation of an article by Kao Chih-kuo (7559 3112 0948), First Secretary of the Communist Party of Yunnan University, in Kuang-ming Jih-pao, Peiping, 7 April 1961, page 2.]

### I. What Is School For?

The school is a place where knowledge is taught and talents are developed. Our education is for the unpropertied class. If we want to train individuals for constructive services based on socialism, our objective of education should be for services in unpropertied-class politics and for unity of education and productive labor. This is a sound approach to the development of cultural education of socialism and communism. This is the difference between education of the unpropertied class and education of the propertied class. The unity of education and productive labor does not tolerate the idea that teaching does not have to be the center of all school activities. School activities require that teaching should be the center.

Some individuals use certain principles of teaching as a pretext for denying the Party its leadership in education, and of denying education of its function of service to the unpropertied class, saying, "The school is being used as a center of all kinds of suppressing activities." This is a false accusation. It must be opposed and criticized.

Since the educational revolution of 1958 we have criticized and fundamentally reformed this kind of self-assumed leadership, which had for its objective the separation of education from the Party. We have corrected the tendency of education being separated from unpropertied-class politics. We have established and strengthened the leadership of the Party in connection with the school system. We have realized the unification of education and productive labor. We have brought about a change in the reflection of the function of schools. Whether or not we can sustain the unity of education and productive labor is a good indication of the kind of education we are administering, i.e., whether it is unpropertied-class education or propertied-class education.

In this connection the productive labor schedule for the students in the full-time schools in our education program must be properly adjusted. We must not advocate a "the more the better" policy, so far as productive labor for the students is concerned, for according to the principle governing the development of things, there is a numerical limit and there is a

quantitative limit. By permitting the students to work too little, or not requiring them to work at all, we would fail to achieve our objective of training them to be workers with culture and with a comprehension of the meaning of socialism. On the contrary, if we make them work too much, there will not be sufficient time left for instruction in the classroom. In that case, we would also fail our objective.

In 1960 our own schools and our fraternal schools throughout the country initiated a movement for reform and revolution in the arts and sciences, for the purpose of promoting agricultural production; also, for a reform in teaching. Compared with 1959 the working hours were longer, but owing to the reasonable adjustment of the schedules, there was no interruption of instruction. The weekly attendance record even showed a gain of three weeks over that of 1959. In the area of teaching, our plan was consummated rather successfully. In 1960 we took advantage of the extra time saved through efficiency in the students' labor program, and assigned to the students some teaching work. For example, out of the 109 days of the year in which the second-year students in the literary (vs. vernacular) sections of the Chinese language classes were supposed to be engaged in productive labor, about 40 hours were spent in teaching. The students in the third-year physiology classes spent 57 days of the 109 days on activities in scientific research.

We have profitted by experience in the experiments that we tried during the past two years. We tried and proved step by step that all school activities must center around teaching. Our schools successfully carried out our plan of assigning teaching work to students and making them participate in all extracurricular activities in the various movement, all within the framework of productive labor. Thus, we have taken a big step forward in our activities of promoting new ideas in the arts and sciences.

Our schools, under the influence of the doctrine of "teaching as the center," have completed in time the task of teaching at no expense of either quality or quantity; have satisfactorily regulated the relations between teaching and social activities, between teaching and scientific research, and between basic studies and specialized studies. In our practical application of the principle of "teaching as the center," we have made it possible for our students to participate in productive labor and scientific research without any sacrifice of their studies. We do not teach with productive labor and scientific research as our primary objective. Under ordinary conditions our teachers always succeed in completing their teaching work according to schedule, while the students intensively participate in various necessary social activities and in activities pertaining to industrial and agricultural production. We have never been derelict in our duties in connection with teaching.

Would emphasizing teaching as the center of all activities result in a tendency among the teachers and students to under-rate the importance of productive labor and to be unconcerned about politics? The answer is no. Facts have proved that self-consciousness in the teachers and students of participation in productive labor has evolved to a higher degree in the

past year. This is also true with their self-consciousness pertaining to idea reform. We all realize that the question at hand involves the incorporation of politics into teaching; making this incorporation red but reasonably balanced. We must seriously and subtly prosecute our program of reforming teaching, and of directing all teaching activities in the right direction and on the right path. In this way we will be able to call forth positive action on the part of the teachers and students, and enable the teachers to bring about the unity of service and reform in their practical application of the principle of teaching. Insofar as the students are concerned, their self-consciousness of ideas will be heightened, their minds enlightened, and their positive action of learning greatly stimulated. Such is the result of activity in ideology politics.

Would emphasizing teaching as the center of all school activities have any ill effects on political services in education, which is for the unpropertied class; would it have any ill effects on services which we are obliged to perform in sustaining the industrial and agricultural productions? No. Facts have demonstrated that in the past year all personnel in the schools from the principles down to the teachers and students have clearer ideas in regard to services based on economic principles. For instance, those in the biology department have made an about-face change in their attitude, which was formerly one of emphasizing wild life, belittling domestication, appreciating nature, and ignoring modification of nature. They have made certain contributions in connection with the sustenance of industrial and agricultural production.

Of course, the effort we concentrated on teaching activities has not been sufficient. For example, in the area of teachers' qualifications we have not been exerting our utmost to raise the standards to where they should belong. At present the young teachers constitute a great majority of the faculty of institutions. It is an undertaking of paramount importance to train them systematically according to a consistent plan, and by so doing, to raise their standards with respect to their qualifications. For many years we have been emphasizing that teachers should participate intensively in productive labor and in various political movement activities for the purpose of increasing their comprehension of politics. Learn as you do. Improvement increases as one continues to participate in practical work. This viewpoint is entirely sound. But we have not been doing enough in our advocacy of training teachers to be politically-minded yet professional, hardworking but thorough, and in our endeavor to raise their professional standards. We emphasize breaking down superstitions and emancipation from fixed ideas. We courageously instituted a program of special studies for young teachers. This is necessary in view of circumstances, and is sound in principle. But we haven't accomplished as much as we would like to in helping them to increase their teaching knowledge and skill, and to continuously cultivate their professional growth. We have succeeded to a certain extent in giving them a broader and deeper understanding of the students from the points of view of theories and knowledge. But even in these areas we have not done enough. Besides, what we have done has not borne fruit to an appreciable extent. All this demonstrates

that the doctrine of making teaching the center of all school activities that we advocate has not been universally and thoroughly carried out.

In order to thoroughly carry out the educational program of the Party, we would have to inaugurate a thorough revolution in the area of ideas. It is very natural that in order to correct the tendency of separating education from production, occupation from politics, and theories from facts, in a thorough manner, we must correct our mistakes and keep ourselves on the right track. We must continue to be vigilant in our determined effort to overcome any tendency of these wrong ideas of separation that may develop. But we must realize, in view of the process of such a historical development, that our idea of firmly establishing teaching as the center of all school activities on a universal basis will face opposition. It is as plain as day that the doctrine of making teaching the center of all school activities is not an old doctrine revived.

#### Life Security As An Assurance of Good Teaching

In our program of making teaching the center of school activities our primary concern under the present circumstances is finding ways and means of improving the living conditions of the teachers and students. By not improving the living conditions and not insuring sound health for them, we failed to provide any material basis for our doctrine of making teaching the center of school activities. But since October of last year we have been doing a fairly good deal of work in this respect. We have enlarged our vegetable gardens, animal and poultry farms; we have increased the supply of supplementary foodstuffs to the teachers and students, thus greatly improving their livelihood. During the past year we have conducted many general health examinations. The health of the teachers and students is generally good. All this is necessary assurance for good teaching.

To assure a well-balanced combination of work and rest, we have conducted two scientific investigations at different times with respect to teaching and productive labor, and teaching and physical education. We regulate and coordinate teaching and other activities in such a way that the two are going on smoothly in good order.

In order to improve the livelihood we must know what we are doing in trying to achieve our objective. On the one hand, we must assure the teachers and students of their necessary requirements in connection with livelihood within our capabilities, and on the other hand, we must intensify our educational program relating to political ideas, to enable them to deal with their life problems. We must promulgate the virtue of being industrious and frugal, point out the way to them of positively high standards of teaching, and raise the standard of education both quantitatively and qualitatively.

#### Why Must Teaching Be Made the Center of School Activities?

Why must teaching be made the center of school activities? After

one year's experience we have come to the following realizations.

The school is the upper level of our social structure construction. It must assume the responsibility of rendering services to the building of a solid economic foundation of the country. We are absolutely sure of this point. In this respect the school is the same as the factories, military units, and other governmental agencies. It must adapt itself to the conditions of political struggles and to the requirements of industrial and agricultural production; it must participate in the various all-people political movements. But the school is a school, after all. Just as the army corp's principal duties are to get trained and prepare for potential wars and for national defense; as the factories and farms' function is to produce, so the school's function is to train individuals for services in construction under our socialist system. In order to train qualified individuals for such services, we must establish schools. We must deal with practical situations; we cannot isolate ourselves from society and be satisfied with ourselves. But under general conditions, while organizing the teachers and students for participation in political movements and in the sustenance of industrial and agricultural production, the school must maintain order and carry out its plan of teaching. Otherwise, the school is no longer a school!

In the great leap forward all activities must make tremendous progress. We all must march forward. Since labor force is in demand everywhere, the schools very often are requested to send students to participate in labor activities. Under the circumstances, how should the schools handle the situation? Obviously, we must give the matter our serious consideration. First, we must not forget that the school is a school. We cannot afford to take the matter lightly and upset the schedule of teaching at will. If we deem it necessary to comply with a request, we send students. Otherwise, we just decline. When we feel that we should participate less often, we do that. On the other hand, if circumstances necessitate our exploiting the situation, we would not let the opportunity slip by. If we think clearly and make our decision according to our best judgment, no one concerned will complain.

The individuals trained and turned out by us must be socialism-conscious workers with a cultural background. They must be red and specialized, or, to be more exact, they must be red but somewhat specialized. If they are mostly specialized, but not red, it is a case on inclination. Such people must be opposed determinedly. If a person is insufficiently specialized, he has no knowledge of a definite field, or capacity for practical work. Such a person does not meet the requirements for socialist construction. In such a case, the school has not satisfactorily discharged its duty of training and turning out a useful talent. Since Party education has been thoroughly enforced, the wrong notion that education should be separated from production, occupation from politics, and theory from fact has been criticized and banished. This is the most important aspect of our problem.

But we very often unconsciously have the tendency to underrate to a certain extent the importance of acquiring a knowledge of culture and

science. Some teachers do not dare to be firm in demanding that their students meet the requirements. Some students entertain the wrong idea that if they read extensively this would make them specialists in the end. We must pay proper attention to this problem. On the one hand, we must continue to bring about idea reform among the teachers and students. On the other hand, we must bring up the question of the importance of a solid foundation of a systematic knowledge of culture and science, especially knowledge of fundamental principles. We consider that in order to carry out the Party's education program, there is a definite necessity for us to bring about, step by step, an understanding that in the process of accumulating experience there is a certain period when we should pay more attention to some particular aspect. Now that we have three years' experience, we should be able to understand and prosecute more thoroughly the Party's educational policy, and to deal more satisfactorily with the relationship of between red and specialized.

In order to train and turn out qualified talents, we must assure sufficient time for teaching. In the arrangement of time for teaching and productive labor and scientific research, between studies in politics and studies in occupation, there must be a proper and definite proportion. In the unity of teaching, productive labor and scientific research, certain parts of the curricula can be executed at the scene by mere instruction. But instruction in the classroom is, after all, an important form of teaching. It must be assured sufficient time. However, to make sure that the students digest and retain the knowledge they have learned, and to cultivate in them the ability to think independently, time for self-study, and working on practical problems must be assured also. The relation between quantity and quality is a dialectical unified relation. Without a certain numerical quantity, necessarily there can be no quality-quantity unity. To assure teaching of quality and quantity, necessary time for teaching must be assured. Of course, there is a limit to time. In addition to the activities mentioned above, the development of subjective action in the students must be emphasized. Therefore we suggest: in every course of instruction, every examination, and every guidance discussion, a high standard of quality and quantity must be definitely maintained. At the same time, we must also pay attention to the unity of work and rest, avoiding excessive burdens on the part of the both teachers and students.

#### Statistics As Necessary Information for Leadership

In order to put into thorough practice the principle of making teaching the center of school activities, we will have to examine and solve some other problems. If we wish to satisfactorily adjust the relationship between teaching and productive labor and scientific research, between studies in politics and studies in occupation, and between studies and livelihood, we must do some conscientious and thorough work on statistics. We are at present doing just this. To enable school activities to go on in an orderly way, we must set up and stabilize certain systems and

regulations to govern examinations, investigations, attendance and work performances, student management, laboratory management, professional growth for teachers, and assurance of necessary livelihood security for teachers. We must do all this on a practical basis, utilizing the experiences we gained during the past three years in the revolution in connection with teaching. In prosecuting this project we must keep an open mind; we must set up these systems and regulations with the understanding that they are subject to modification or abolition.

In applying the principle of making teaching the center of school activities, if we wish to see our objective realized, we must do some reform work in connection with guidance. There are certain things about which we don't have the slightest idea. We don't have any statistics on them. Within a comparatively short time we must compile some workable statistics to base our future plans on. The following are some of the things about which we are in the dark: how many books has each student read since entering school? how much time has he spent on labor? on his studies? on labor in proportion to other activities? what is proper? what is reasonable? what is considered to be unreasonable? Some of us do not have any idea in regard to the following: how much basic knowledge must a student acquire? How can one do one's lessons well? What should be the relation between basic subjects and specialized subjects? How can one build a good foundation of basic subjects on which one can learn one's specialized subjects well? Frankly, we ourselves are not sure of answers to these questions.

If we are to assume leadership in the realm of teaching, we must involve ourselves deeply in the profession of teaching. We must be thoroughly familiar with the principles of teaching. We must acquire the knowledge that is necessary for that profession. In view of existing conditions, we must deeply penetrate the realm of teaching and engage seriously in investigating and research on a large scale if we are to take the role of leader. We must venture on our undertaking with a sense of reality and sincerity. When we are confronted with difficulties, we must not hesitate to discuss our problems with the masses. We must take the initiative and assume a positive attitude. By being occupied with activities and by activating people, we shall raise our standard of leadership to a new level.

## EXTRA-CURRICULAR ASPECTS OF EDUCATION

Following is a translation of an article by Wen Tsung (文宗), in Kuang-ming Jih-pao, 8 April 1961, page 2.<sup>7</sup>

After this semester had started, advanced schools throughout the country have conscientiously and comprehensively overhauled instruction in accordance with the spirit of coordinating instruction, productive labor, and scientific research. Instruction in basic and specialized courses has been strengthened and students' extra-curricular study and time for free activity have been increased. University students' enthusiasm for study has vastly increased, and everywhere may be seen attractive manifestations of interest in learning. How to still better regulate and utilize time outside of classes for study and free activity is a question being currently considered by a great many university students. It is just as one university student said: "In the past our time was so taken up and so regulated I could simply follow along with the others. Now that there is a lot of time which I may freely allocate, I must think the matter over myself and decide such matters as how time should be spent and what reference books I should study". These are new conditions and new features of present school life.

Everybody and every group from the school leadership to each teacher and each party or other organization among the students should pay attention to these new conditions and should respond suitably to these new features. They should actively strengthen their overall leadership of the students' extra-curricular activity and should help the students consciously utilize these objectively beneficial conditions and make an even more outstanding record of ideological achievement and achievement in studies.

Students' extra-curricular activity consists mainly of two aspects: extra curricular study and cultural and physical cultural activity. After attending class, students must have adequate extra-curricular study if they are to absorb and digest the knowledge transmitted to them by the teacher and if they are to progress and develop. The quality of the students' extra-curricular study has a bearing on the question of improving the quality of instruction. Cultural and physical cultural activity is an important part of carrying out socialist and communist ideological education and is an important aspect of the students' all around education. If only periods during which instruction is being

given are properly regulated and time outside of class is not well regulated, then the job is being only half done. If school activity is to be comprehensively regulated, then time outside of class must also be considered. Under current new conditions which have given more time to the students for study outside of class and for free activity, a strengthening of overall leadership of the students' activity outside of class is of the greatest significance.

Among the conditions which bear at present on the students' extra-curricular activity, there are two points which have a wide spread application and which are worth our attention. The first question is, "how can the students' extra-curricular activity be led forward in the right direction?? School activity is an integrated whole; extra-curricular activity, instruction, productive labor, and scientific research are all mutually related; a large part of the students' life is taken up by such matters as reviewing lessons, carrying out particular duties, engaging in social activity, and in cultural and physical cultural activity. In order to familiarize students with this feature of extra-curricular, it is necessary to pay attention to allocation their time and to their ideological education, and thus lead the students to consciously recognize the positive objective of a comprehensive regulation of their time and to profoundly understand the close relationship between study outside of class and instruction in class. The students must be taught that the objective of all extra-curricular study should be to comprehensively achieve the educational goal fixed by the State. The students may choose reference works for out of class study, according to their educational foundation, their particular ability, and their preferences, but the selection must be in accordance with the educational plans and the reference work must be carried out according to the planned objective of the course; this procedure must be adhered to. Cultural and physical cultural activity should be appropriate to person, time and place. It should rigorously adhere to the principle of voluntarism, small scale, and lots of variety, simplicity and ease of execution, and richness of content in order to be beneficial to the students' positive leisure, to expand their spiritual horizon, and to cultivate in them a lofty morality. We must help the students to correctly regulate such related activities as communist and specialized education, study inside and outside of classes, individual research and collective study, and labor and leisure. Thus we may avoid an over-emphasis on any one aspect of the study at the expense of some other aspect or other faults.

The second question is, "How can the students be helped to do a good job on their studying outside of class?" The central work of advanced school is to raise the quality of instruction and all other aspects of work should revolve around this central work. The various schools are emphasising teaching materials, and for a very large part of the courses teaching material or printed lectures are available and are

distributed to the students before class. A good many of the experienced teachers have assumed the responsibility of teaching /presumably in addition to class instruction/. Additional precise regulations have been given to students to govern their study outside of class. All these measures have created for the students conditions which are beneficial to their study outside of class. In those courses for which the teaching material is relatively fixed, it is necessary that a part of the original content of the course presented in class be set aside for the students to study themselves. This will satisfy the requirement that the teacher supplement the content of their instruction, that the quality of the courses be improved and that the content of the courses given in class be reduced and refined. It is required of the students that they utilize more time to study by themselves, that they undertake creative study, that they better understand and digest the knowledge they have obtained in classes, that they study assigned reference material, and that they continue to increase their capacity to master theory and to make penetrating analysis of problems. That is to say, increased demands are being made on students for independent study. At present, not all of the students are able to meet the requirement. In general there are different conditions prevailing in respect to this problem. Some students, when they find that their free time outside of class has been increased, become carried away in their fervent desire to read widely and to broaden their practical experience and they do not have a sufficient knowledge of what a complex mental effort is required to obtain knowledge. They are not good at combining the principle that there must be a process of selection and orderly progress in obtaining knowledge with their urgent study requirements. Some students are in the habit of following a course schedule and doing prescribed class work. They are still not good at independently regulating their studies outside of class in such a way that study progress may result. Some students still lack experience and practice in carrying out creative mental labor, and a portion of the younger students have not yet grasped the fundamental laws of study. Faced with these different conditions and situations, the teacher finds his responsibility increased, for he must vary his methods with different conditions and the concrete guidance he offers must take into account the individual problems. The teachers should also be aware that in order to make their guidance correspond with reality they must suitably alter their methods. For example, when the amount of time allotted to independent study has been increased, there will be a relative increase of separate and individual study and activity. The modes of help and guidance which were applicable in the past when emphasis was on collective activity will no longer be sufficient and there must be a suitable increase in individual help and guidance. Furthermore the scope of guidance must be increased over what it was. Matters such as working out a study plan, selecting reference books and magazines, answering difficult questions and even methods of study, all must be given concrete and detailed guidance.

The strengthening of overall leadership of extra-curricular

activity is at present an important subject in the schools. Some schools have already done a good deal in this respect, and have gained experience. In order to make continued progress in this work, it is necessary that examination and research of the question be done among all the students and that a still more comprehensive and solid ideological education and concrete guidance be made available.

PRACTICAL REQUIREMENTS DETERMINE INSTRUCTION AT THE  
PEKING NORMAL SCHOOL FOR NURSERY SCHOOL INSTRUCTORS

Following is a translation of an article in Kuang-ming Jih-pao, 11 April 1961, page 1.

The Peiping Normal School for nursery school instructors takes practical requirements as its point of departure. Basing its instruction on the concrete conditions with which the students will be faced, this school had reinforced the training in skills and techniques which graduating classes receive, this actively raising their capacities for practical work. At the same time, there has been an increase in the content of material dealing with the villages, so that when the students have graduated and gone to the villages, the work of establishing their families and pursuing their occupations will be facilitated and they will be able to aid in agricultural production.

This year, at the Peiping Normal School for nursery school instructors, three classes of middle instructors graduated, their total number being 128; two classes of beginning instructors graduated a total of 96 students. During the past few years, because this school has earnestly and thoroughly carried out the Party's educational policy, because it has emphasized the overall development of moral, intellectual, and physical education, and because it has employed various kinds of vital, stimulating, and effective educational activities, the students have already fundamentally conceived a love for nursery level education and have determined to devote themselves to the people's education. On this foundation, the school has strengthened training in skills and techniques, so that after graduating the students will possess the capacity for independent work necessary for coping with practical requirements and will become educators at the nursery school level who "put equal emphasis on education and on rearing" and who are conscientious in caring for all aspects of child's life. Before undertaking this work the school did a good deal of research and investigation. For example, the students were summoned to discussion meetings. At these meetings an understanding of the students' requirements and hopes was gained and the students made clear what was still lacking and what was still required in their work. In order that the students' demands and hopes might conform more to reality, the students familiarized themselves with actual conditions through organizing thoroughgoing investigations and interviews in the field of nursery school education. Actual practice

was combined with the curriculum and students were permitted to take part themselves in the organization of the children's "a day's life"; the problems which thus arose were based on concrete practice. Students which had already graduated and begun work were invited back to the school where in their discussions they introduced the working conditions, and in particular the difficulties encountered and how these difficulties were conquered.

In the past there were a good many students who believed "there is nothing to nursery school education; any domestic woman can do it." "It is not necessary to take so many courses; if you see that the children are not crying or fussing, that is sufficient." It is only after going in to the kindergartens where they did practical work and had contacts with the children that the students truly understood that education at the nursery level was not so simple as they had thought. They saw that when experienced teacher organize various kinds of activity for the children, the children were obedient and orderly, but when they themselves attempted to take over, things went badly; it seemed that the children intentionally made difficulties. They frequently put things into a state of confusion and when one tried to look after this, then that would get out of hand. From actual practice they learned that there was a great deal to be learned and that study must be done earnestly. Hence they took seriously training in techniques and skills.

In carrying out training in skills and techniques at the Peiping Normal school for nursery school instructors, the first thing done was to lay a solid foundation of knowledge by doing a good job of teaching the fundamental material in the course work. For example, in language courses the study of children's literature was intensified. In composition courses, students were permitted to invent stories and write children's songs. Next emphasis was placed on courses in method of instruction, so that when the students graduated they would bring to their work rich instructional content and would have mastered instructional methods suitable to children. The third point was to strengthen the apprenticeship and practice teaching work to permit the students to verify the knowledge gained from textbooks in actual practice and also to combine closely theory and practice to actual participation. Teams of students have already begun to do practice work in urban areas; in the next phase a large number of them will do practice work in the villages in order to facilitate their educational work at the nursery school level when they enter the great areas after graduation. The training also enabled them to help agricultural production. In their courses on instruction, there has also been an increase in material dealing with rural nursery school level education. The fourth point is to coordinate extra-curricula activities to train students in skills and techniques. For example, producing children's plays and public shows, organizing harmonica bands and story telling sessions and organizing groups for chanting poetry, for singing and dancing. The students also listen in a planned way to children's radio program such as "The Little Bugle" and "The Sunflower" in order to learn how stories should be told.

## MATHEMATICS TEACHERS OF SHANGHAI RAILROAD MIDDLE SCHOOL ADVANCE THEIR TEACHING LEVEL

[Following is a translation of an article in Kuang-ming Jih-pao, Peiping, 25 April 1961, page 2.]

Under the leadership of the school Party Branch, the teachers of the Mathematics Teaching and Research Section of the Shanghai Railroad Middle School have worked along the direction of both Red and specialized, making seven years like a day. They have firmly executed the on-the-job education to greatly advance their teaching. Thus, they have solved the problem of insufficient senior-middle-school mathematics teachers with a raise in the teaching quality.

When the railroad middle school was established in 1954, it was only the junior middle school. At that time the mathematics teaching and research section had the lowest quality among teaching sections in the whole school with teachers who were mostly transferred from primary schools and organizations. They not only lacked the experience to teach middle school mathematics, but also lacked the systematic culture knowledge of that particular subject. However, under Party leadership, the teachers simultaneously advanced by self-cultivation, progressing, and teaching to gradually overcome the teaching difficulties.

In the training of teachers, this teaching and research section, under the Party leadership, has thoroughly paid attention and stressed the political thought work in firmly maintaining the politics as command. When the school started to establish the senior middle school classes, some teachers considered their educational level to be so low that the teaching of third grade of junior middle school was their maximum ability. Some teachers wanted to enroll in normal university to study advanced education before they returned to teach in school. Pointing out these thoughts, the teaching and research section discussed the problem of "whether you dare to catch up, and whether you can catch up." Through discussions, they realized the situation of the requirements of the teachers. Later, to overcome the shortcomings of unsatisfactory relationships between the new and old teachers, the teaching and research section organized discussions to enable them to realize that the old and new teachers have to help each other, to supplement each other, and to advance mutually. Here, the thought foundation was laid for the advancing of teaching quality.

Excepting the attention paid to the political thought work, this section further helped the teachers solve their practical problems. Owing to the rapid development of education, many teachers followed the students

to teach the higher grades with new education every year. There were all new teachers in the whole section at one time. How to do the job? After discussions initiated by the teaching and research section, the method was adopted to bring up the new teachers by the "old" teachers, i.e., the higher class teachers concurrently taught the lower class and prepared the lessons with the new teachers, and the new teachers listened to the class lectures by the "old" teachers. Thus, the educational level of the new teachers advanced very rapidly.

For instance, a teacher was transferred to a school from an organization. In the first semester, there were plenty of difficulties in teaching with low teaching quality. In the second semester, the teaching and research section adopted this method of letting the "old" teachers help him solve many concrete difficulties. He advanced very rapidly with a quick raise in teaching quality. At the same time, they paid much attention to systematically raising the cultural and scientific level. All the teachers of the section, under the support and arrangement of the school, enrolled in the city advanced college, television university, or normal university for further learning.

The other cause of the teachers in this section quickly raising their teaching level in recent years was because they have incessantly advanced themselves in political awareness to firmly maintain diligent study and research. All teachers of the section firmly maintain advanced study, and some teachers further stick to it, making seven years like a day. Their diligent studies had overcome many difficulties. For instance, during the last year all teachers of the section participated in the study of "senior middle school physics." Some teachers had never studied this lesson before. They read the text for five times and still could not get the point. At that time, they were almost unable to learn. However, they thought that there was an intimate relationship between senior middle school mathematics and physics. In the text, there were many references to a knowledge of physics. In raising the teaching quality, and being a good mathematics teacher, physics should be learned thoroughly. So they made up their minds and firmly determined to continue studying. First, they thought of the problems deeply. With these problems that still could not be understood, they went to ask the physics teacher. If the first explanation still could not make them understand, then they asked the physics teacher to change to another approach of explanation. If they still did not understand, they then asked the physics teacher to conduct experiments. At last, the difficulties were gradually overcome.

Now the levels of politics, culture, and operation of the teachers of this section have an appreciable raise with a great change of the thought appearance. Some new teachers have recently participated in the Party. Among the 11 teachers in the whole section, there was originally not a single one who had taught senior middle school. By now there are seven teachers teaching senior middle school including three who are capable of teaching any mathematics lessons in any class of the junior or senior middle schools. The teaching quality is raised incessantly with the selection of this section last year as the advanced collective to

participate in the heroes' meeting of the All-Shanghai Cultural and Educational Institutes. However, they still do not satisfy these merits. Now they are further advancing along the route of both Red and specialized to continuously struggle for advanced learning in incessantly raising the teaching quality.

## SINKIANG HAS PROSPEROUS ART CREATIONS

/ Following is a translation of an article in Kuang-ming Jih-pao, Peiping, 26 April 1961, page 2./

Under the leadership and cultivation of the Party, the literature and art creations of the nationalities of the Sinkiang Uighur Autonomous Region have been ever active and prosperous. There are 88 members of the ten nationalities in the Branch Association of the Sinkiang Uighur Autonomous Region of the China Writers' Association. In the first stage of the Liberation, all Sinkiang had only a few professional writers, but now there are more than 700 professional and amateur writers. There are three literary magazines by the names of Tarim, T'ien Shan, and Brightness (Shu-kuang) in three languages of Chinese, Uighur, and Kazakh.

The professional writers of the different nationalities along with the mass amateur writers constantly mingle with the workers, peasants, and soldiers. The greatest character of their writings is centered on the unification of the nationalities to reveal from all sides the heroic and vigorous spirit of our time in engaging socialist revolution and construction by the various nationalities, in establishing the heroes' figures with the impressive moral of communism.

"The Process of Battle" by Sai Fu-ting (6357 4395 7844) sufficiently revealed that the Han and Uighur peoples shared the same difficulty and fortune in the hardship years. The Blood Friendship in Battle by Pao Erh-han (0545 1422 3352) further revealed the remote historical background to show the traditional friendship between the Han and Uighur peoples. The newly-published Long Live the Party's General Line, Long Live the Great Leap Forward, Long Live the People's Communes, and other special collections were the writings of the more than 150 poets in Chinese, Uighur, Kazakh, and Mongolian with enthusiasm to the praisings of new living, new figures, and new thoughts.

There is another characteristic of these writings. On the good traditional foundation of the nationalities, there are the development, reform, and creation of the literature structure in bright nationality attitudes loved by all. The Uighur writer Tsu-nung Ha-ti-erh with his background in rural living, has the essays he writes filled not only with the colorful nationality figures and languages, but also with story conclusions greatly affected by folk-tale literature.

The poetry and songs of the Kazakh poet K'u-erh-pan A-li are alive with descriptions of the ranches in the Ili River Basin. The Kirghiz writer Wu-nu-tzu-pieh-k'o-fu who lived in the Pamir Plateau, has his novel

Bright Sun among the Snow Mountains bringing the readers suddenly to the Pamir Plateau to show the great variation in the high plateau and the Kirghiz people's construction struggle in the mountains. The herdsman A K'en (the folk singer) and A-le Ma-t'ai have their poetry tell tales like the clear water of the Kazakh steppe.

Following the growth of the professional and amateur writing groups, literary creative activities through the forms of "poetry contest meetings" and the "country of poetry" have been developed in the urban and rural areas as well as in industrial, mining, agricultural, and ranching territories. Much valuable literature inherited from the past has been saved from lost tradition. The Uighur history-poetry, "Ai-li-fu-sai-nai-mu," and the Kazakh history-poetry, "Hero A-ch'ia-le-k'o," folk tale "Hero Ai-li-k'u-erh-pan," and other classic epics, folk songs, and common sayings have been regulated and published.

At present, writers of the various nationalities of the autonomous region have settled down in the countryside to introduce the living conditions of the first line of "greatly developing agriculture, especially grain."

CUBA WILL CONVENE THE FIRST DELEGATION CONFERENCE OF  
WRITERS AND ARTISTS

[Following is the translation of a news brief in Kuang-ming  
Jih-pao, Peiping, 28 April 1961, page 3.]

Recently the writers and artists in Cuba convened a meeting in which they decided to convene the first delegation conference of the writers and artists in Cuba in the last week of June.

This meeting was sponsored by Chia-hsi-ya Pu-ch'a-ch'ia [Cuban name], the secretary of Cuba's National Cultural Committee, with 135 participants. A poet Chi Lien [Cuban name] made speeches at the meeting. He pointed out that the writers and artists have to be organized in accomplishing the revolutionary missions.

At the meeting it was decided that a preparation committee will be appointed to be responsible for the organization work of the delegation conference. Chi Lien was elected chairman of the executive section commission of the committee. It was also decided at the meeting that the signatories of the declaration of writers, artists, and intellectuals as made known on 19 November of last year are automatically members of the preparation committee.

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